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BIRCH'S MANAGEMENT AND MEDICAL TREATMENT OF CHILDREN IN INDIA

FIFTH EDITION

BY

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HISTORICAL NOTE.

THIS work which is probably the oldest professional book still in publication in India was originally written by Surgeon Henry Hurry Goodeve of the Bengal Medical Service and published on March 15, 1844, as a very small volume, privately printed, under the title, *Hints for the General Management of Children in India in the absence of Professional advice.* It is of interest, perhaps, here to quote the original Preface to this first edition as it has been the keynote of all the subsequent ones.

* * * * * *

ORIGINAL PREFACE.

"*In offering these few pages to my patients, I do not, for a moment, pretend to give them a complete treatise on children's diseases. Nor do I wish, in any way, to prevent their taking medical advice, where it can be obtained. On the contrary, I would earnestly caution them never to trust to their own judgment, when they can procure professional assistance. The observations and advice contained in this little pamphlet, are intended, merely to aid those (a large class in India) who are placed at a distance from the advice of medical*

practitioners: and if this work prove beneficial in a single case, I shall be amply repaid for the time I have bestowed upon the subject."

* * * * * *

A second edition was called for in less than six months and issued on September 1, 1844. A third followed in October 1852, and a fourth in 1856. Even this fourth edition was only a very small book of 138 pages. The fifth edition was edited by S. C. G. Chuckerbutty; the sixth by Joseph Ewart in 1872. The Seventh Edition was entirely re-written by Birch and was the first with which his name was associated, as little of Goodeve's original work remained. A second edition was published in 1886, a third in 1895, and a fourth in 1902.

Brigade-Surgeon Edward Birch was born in 1840 and died on 27th November 1912. He entered the I. M. S. in 1866, and spent nearly the whole of his service in Bengal. He was Civil Surgeon of Hazaribagh, later Superintendent of the Presidency General Hospital, and later still Principal of the Medical College, Calcutta.

PREFACE TO THE FIFTH EDITION.

THE Fourth Edition of Dr. Birch's work, which was the Tenth Edition of the original author, Dr. Goodeve, appeared eleven years ago.

The present edition has been thoroughly revised and the greater part re-written.

More space has been devoted to the consideration of General Hygiene and the Prevention of Disease, and much matter has been added regarding diet. Artificial feeding has been carefully discussed, the advantages and disadvantages attendant on the use of the various proprietary foods being pointed out.

The sections dealing with fevers and bowel diseases have been re-written up to date.

Short descriptions have been given of Kala-Azar, Malta Fever and of poisonous snakes.

Throughout, the idea present on the mind of the original author of the book has been preserved; to give trustworthy instruction as to the rearing of children and to aid missionaries and parents to deal with the emergencies incidental to child life in India, in situations where the advice of a physician cannot be obtained.

Finally, we have to thank Dr. Robert Hutchison for kind permission to make use of two of his lectures on proprietary foods. While Colonel D. G. Crawford has again evinced his perennial interest in everything relating to the medical profession of India in the past and has most kindly furnished the historical note, Dr. Satis Chandra Dass has our thanks for assistance in re-writing the section on fevers.

C. R. M. GREEN.
V. B. GREEN-ARMYTAGE.

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THE MANAGEMENT OF CHILDREN IN INDIA.

PART I.

On the Management of the European Child in India, while in Health.

CHAPTER I.

INFANT MORTALITY IN INDIA,

AS INFLUENCED BY THE KIND OF MANAGEMENT TO WHICH THE CHILD IS SUBJECTED.

WHEN an individual becomes possessed of any piece of property, he will first consider what means he shall adopt to preserve it and to bring it to perfection ; but his energies and zeal will naturally be regulated by two considerations, *viz.*, the value of the property, and the results which he believes are possible of attainment. Assuming the value of the object to be universally assessed at a high rate, it is sure to receive a certain amount of attention ; but its further treatment will wholly depend upon the opinion entertained by its possessor as to his power to preserve it and to increase its value. Should he believe that his efforts are capable of effecting little, if any, change in the

CHAP. I.

ultimate result, he will devote but scanty time and attention to it. If, on the other hand, he is convinced that according to his management so will be the return yielded his interest and his energies will be fully concentrated upon it. So that, after all, it comes to be a mere question of individual belief. This is precisely the situation of the European parent in India as regards his child's health and well-being. *That which the parents believe, will guide the management of their offspring.* Perchance it is conceived that no power for good or evil is possessed, that the details of daily life have little to do with health or delicacy, with living or dying, and that "climate" is responsible for all misfortunes. Whatever be the nature of individual opinions, certain it is, that great ignorance prevails upon this subject, some believing one thing and others the opposite ; but each acting, it may be imperceptibly to himself, upon his convictions or conceptions. Each side has part of an argument to advance, and neither is convinced.

It being quite impossible to obtain an intelligent appreciation of the subjects discussed in this book without the possession of clear ideas as to the effects of good, bad, and indifferent management upon European child-life in India, it becomes a necessary preliminary to investigate these points. In doing so it will not be difficult to demonstrate the terrible results of bad management on the one hand, and the extremely favourable results of good management on the other, in the hope that the knowledge will stimulate the energies of parents in the right direction, and will convince them of the powers they possess, and of the responsibilities they have incurred, as well as enlighten those who are sceptical, of their own ability to influence events.

Prevalent belief mistaken.

There is a vague impression abroad that the climate of India is extremely fatal to European child-life. Paradoxical though it appear, it may be stated that such a belief is at once true and untrue ; the mortality has been enormously in excess of that which prevails in Europe, and it may be lower than, or as low as, that of Europe.

The children of European soldiers in India have been in the past but indifferently cared for in so far as the peculiarities of climate demand, notwithstanding the many efforts which are made to alleviate their condition. Without going too minutely into figures, it may be briefly stated that, under five years of age, the soldier's child in 1870 died in India at the rate of 148 per 1000 of strength. Now the death-rate in England for this period of life was about 64 per 1000, or less than one-half of the Indian rate, as is seen in the table below—

Comparative mortality.

Death-rate of Children per 1000.	England—1871—1880.	Bengal—Soldiers' Children, 1870.	Children of European Troops in India, 1905—1909.
Under 5 years	63·4	148·10	87·59
5 to 10 ,, ...	6·5	17·73	6·30
10 to 15 ,, ...	3·7	11·51	4·27

Comparison satisfactory.

Nor can the comparison be stigmatised as unfair ; for although the management of the soldier's child may be characterised as having been indifferent, we had no approach to the actual bad management, the want, privation, and exposure to which multitudes of the children of the poor in England are subjected.

CHAP. I.

The following table shows very clearly how greatly the death-rate of soldiers' children has been reduced within the last 30 years :—

Average death-rate of children per 1000 per annum.	68·83	during	4	years	(1851-54), Dr. H. Macpherson.
	94·90	,,	6	,,	(1860-69), Dr. Bryden.
	77·73	,,	7	,,	(1870-76), Dr. Bryden.
	67·47	,,	5	,,	(1872-76), Dr. Bryden.
	75·57	,,	10	,,	(1872-81), Bengal only.
	50·22	,,	10	,,	(1881-90), Sanitary Commissioner.
	45·58	,,	10	,,	(1889-98), Sanitary Commissioner.
	41·13	,,	1	,,	(1899), Sanitary Commissioner.
	46·44	,,	10	,,	(1900-09), Sanitary Commissioner.

These figures include all ages below 16. It will be seen from the next table that the death-rate among very young children is improving also, although much remains yet to be attained.

Death-rate of Soldiers' Children in India per 1000.

1872-76	under	one	year	226·61.
1881	,,	,,	,,	214·21.
1891	,,	,,	,,	205·05.
1899	,,	,,	,,	180·16.
1900-09	,,	,,	,,	152·07.

The general result is, however, satisfactory. But it must be recollected that the number of children attached to British regiments has greatly diminished, while the proportion sent annually to the hills has greatly increased. The elder children, too, are not so intensely influenced as the infantile contingent by indifferent management. They soon regain health and strength in the hills, and are probably then better off than the English child of the same class in England.

In support of this opinion, Dr. Fayrer, for instance, considers that up to 6 or 8 years of age European children "thrive, if anything, better than in England."

What, then, is the reason that soldiers' children used to die at a high rate, while of the European

civilians' children an opposite condition held and holds? that native children die at a most excessive rate? that the Eurasian rate is intermediate between these two latter? that the rate which prevails in certain countries of Europe is double or treble that of other European countries? that the rate for England is higher than that of Scotland, and that it even varies in certain districts of England itself? The reply is summed up in the one word, management. "In respect to the management of infant health, and referring to the theories and empiricisms brought to bear upon it," writes Sir R. Martin, "I have everywhere observed that even the fatal results of mismanagement but rarely cure the mother of her theory or her quackery,—so much stronger are ignorance and prejudice than death." For this very reason we have appealed to the intelligence of the reader, who, if he will but reflect upon the facts here put before him, ignorance, prejudice, theories, and quackeries cannot prevail.

Individual responsibilities.

Whether your child is to live or to die in your far-off home is therefore a matter which lies largely in your own hands. "The treatment of the child in the first twelve months either destroys his life or leaves indelible traces on his future existence," wrote Farr, who procured detailed accounts from several countries in Europe of the treatment of their babies, and found it to be very different, and in many instances very sad. "Here they are bound up like mummies; there they are not nursed by their own mothers, and as they advance in age are fed on improper food;" and to the difference in management the difference in mortality is shown to be due. The same great authority observed that there is something terribly faulty in the present mode of treating infants in England, "for if the English mortality from convulsions were reduced to the Scottish

Investigations as regards Europe.

CHAP. I.

standard, 17,000 lives would be annually saved to England. These 17,000 lives who annually die in England from convulsions above the Scottish proportion are truly lives wasted and their deaths are truly preventable deaths. There cannot be the slightest doubt that the cause of the very high mortality among the nursing children of England is that they get spoon-food far too early in life, before the stomach of the tender babe can digest anything but the mother's milk. This is, indeed, the vital difference between the mode of feeding infants in England and in Scotland." As a further illustration of the result of neglect it may be mentioned that the mere fact that a child is born out of wedlock doubles the chances of death within a year of birth (*British Medical Journal*, 1886).

In other words, out of 1,000 legitimate children born in Glasgow, 142 die before they reach their first birthday, while for illegitimate children the corresponding figures are 277. The high tribute which is exacted by death from the parents of infants in the many districts of England is due to the same causes as those alluded to by Farr. Whereas agriculturists are far more fortunate.

The squalor, dirt and confinement of parts of all large towns exert their influence in a very perceptible way among the children of the poor, just as they do in the native portions of Calcutta.

As regards Calcutta.

"That a high rate of infant mortality should prevail in native Calcutta will appear natural to those who know the effect of filth and foul air on infant life, but the full measure of this needless destruction of life can only be understood by consideration of its special causes, of the singular exemption of European infants, and of certain saving influences which are in existence

here, but are neutralized" (Payne). But though dirt in Calcutta plays its usual part in enhancing the mortality, in the more filthy localities the actual death-rate is but slightly in excess of that of the cleaner places; and the proportion of deaths among the various races is maintained without variation in all localities, proving that the terrible result is really due to the domestic treatment of the infants, and not primarily or principally to dirt.

Advantages of the tropics.

It has often been remarked that there *ought to be* a low rate of infant mortality in India, seeing that tuberculosis is far less likely to be developed in a tropical than in a temperate climate, and that scarlatina, whooping-cough, and other affections peculiar to childhood, are either uncommon, or run such mild courses, as virtually not to affect the death-rate. "Calcutta, among its resources for the destruction of infant life, does not include those less avoidable causes of death which work elsewhere, but owes to qualities, or habits, of its own the pre-eminence which must be assigned to it among deadly places. That European infants die in small numbers means simply that they are not subjected to the same fatal treatment; and that the mixed races hold an intermediate place is due to the admixture of native habits among the poorer classes. Death, where it abounds, does not arise from climate, or any cause that is out of reach, but from that which the people have created and perpetuated for themselves" (Payne).

Causes of illness preventable.

Happily, the verification of the legitimate anticipation that a low death-rate is normal to India has now been attained; and it is proved beyond gainsay that the management to which parents subject their children is the great factor which influences the result.

CHAPTER II.

GENERAL EFFECT OF THE CLIMATE

UPON THE CHILD'S CONSTITUTION.

The danger of carelessness.

FROM the previous Chapter we see that there is really a very hopeful—indeed, we may say a satisfactory—side to the question, in that the climate is deadly only as we make it so. But is the climate of the plains of India in no way inimical to the European child's constitution? No well-informed person will reply to this question in the negative. Unfortunately, it cannot be said that no hurt is to be apprehended greater than might occur in its natural climate. On the contrary, it may be laid down as an axiom that *an amount of carelessness which in England will give but an ordinary English death-rate, will in India yield a frightful mortality.* Neglect, in India, will render the chances of survival much less than those of death,—in a word, to preserve our children to us in normal proportion we must adopt precautions more stringent than are called for in England.

With care, climate not a danger.

There is a pretty general medical opinion that the Indian climate does not in any way injure the health of the European infant during the first year of its life; further than this, the conviction is prevalent that with proper precautions up to the age of 5 or 6 years the child may be reared nearly as satisfactorily in the plains of India as in Europe; but beyond these ages all are agreed that physical and moral degeneration occur. The child then exhibits the necessity for change of climate by emaciating and outgrowing its

When to send the child to Europe.

strength. So profoundly does the climate, after the period of immediate childhood, influence the constitution, that the effect, of a more prolonged residence, is rendered permanent throughout life. Such is the teaching of experience; indeed, Sir R. Martin went so far as to condemn the attempt to rear children up to and past youth, in the plains, as an "altogether cruel and impracticable endeavour." And so it is, unless there be special management. Indeed it is almost invariably found in those children who are reared in the plains till they are 5 or 6 years old that the skin becomes pale, the muscles become flabby, the joyous spirits of children are wanting, and the mind and body are listless—a general condition by no means well comparing with the habits of children born and bred in England. Moreover, there is often a marked disposition to relaxation, and to a loose, relaxed state of the joints in such children, and to consequent lateral curvature of the spine. In 1872 Sir J. Fayrer wrote—"I have no desire to prove too much, as I certainly should appear to attempt to do were I to advocate the theory that Calcutta, or any other part of the plains of India, is a *desirable* locality for the training and nurture of European children; such, indeed, would be a theory as dangerous as false. It has long been known to the English in India, that children may be kept in that country up to five, six, or seven years of age without any deterioration, physical or moral, and in the higher classes of life with probably as little, if not less, danger to life than in England; for most assuredly in some respects—as, for example, scarlatina, measles, whooping-cough, thoracic complaints, and even dentition—they suffer less in India than in England. But after that age, unless a few hot seasons spent in the hills should

Advantages of European climate.

CHAP. II.

enable parents to keep their children in India until a somewhat later age, to do so, is always a doubtful proceeding. The child must be sent to England, or it will deteriorate physically and morally,—physically because it will grow up slight, weedy, and delicate, over-precocious it may be, and with a general feebleness not perhaps so easily defined as recognised, a something expressed not only in appearance, but in the very intonation of the voice; morally, because he learns from his surroundings much that is undesirable, and has a tendency to become deceitful and vain, indisposed to study, and to a great extent unfitted to do so,—in short, with a general tendency to deterioration which is much to be deprecated, and can only be avoided by removal to the more bracing and healthy (moral and physical) atmosphere of Europe." Circumstances, however, combine to prevent some persons sending their children to Europe. For such there ought at least to be immense comfort in the knowledge, that, with properly directed care, the pernicious effects of climate, which carelessness will render disastrous, may be assuredly warded off to a great extent.

This is the proper place to inquire, what are the peculiarities in the infant constitution which render the climate of India obnoxious to its vitality and maturity? The several parts, which compose the body of the infant in any climate, are softer, they contain more blood, and are more fluid than those of the adult. The skin is exceedingly delicate, and the microscopical blood-vessels which pervade the whole body are at this early period of life exceptionally active. The same may be said of the glands. The brain is large, and it is less solid than in the adult. The whole nervous system is developed out of all

How does climate affect the child.

proportion in advance of the muscular system, wherefore the excitability is greater by far than at any subsequent period of life, and it is to be recollected that all the functions of the body are immediately under nervous control. In short, the vital powers are intensely, though delicately, active, the nervous susceptibility is extreme, and so an infant may succumb to an illness before there has been time for it to affect any organ obviously. Now it may be laid down as an axiom that the higher the external temperature, the more susceptible is the system to nervous influences. A hot climate at first stimulates the nervous system (even in the newly-arrived adult), which being, so to speak, in excess in infancy, is in greater proportion thus affected if unduly exposed. Hence we have in hot climates convulsions, fever and death during teething, and an abundance of nervous affections generally, where there is bad management. But a hot climate has a secondary or depressing effect, producing a feeble circulation and lessened muscular power, with consequent congestion of the liver, spleen, and bowels, which are peculiarly soft and vascular in infancy. The minute muscles which ensheath the innumerable blood-vessels of these softer organs, being relaxed, their veins and arteries expand, the result being that a certain amount of blood, which is thus wrongly stored, is lost temporarily to the general circulation and to the nutriment of the body. The balance between the circulation and nervous influence is, in fact, disturbed, and a chill may easily drive a large quantity of the blood, which is on the congested surface, into the deeper and warmer organs, the little blood-vessels of which have lost the contractile power to return it, and thus internal congestion, and a lowered resistance to the invasion of the body by the germs of disease may be established.

Constitutional.

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Moreover, the diseases, conveyed by flies, mosquitoes, and other biting insects or by impure water, are an ever present, though preventable, danger in hot climates.

This knowledge not only coincides with all the facts stated in the first chapter, but it explains them. The infant under ten or twelve months of age, with care, thrives, we have seen, as well if not better in India than in Europe, because the large amount of heat which is natural to it, and which then is one of its greatest requirements, it has in abundance, and at the same time means are taken not to expose it to excessive heat. It possesses freely the blessing of fresh air, more so than in Europe, and its food being everywhere uniformly simple, the vital functions enumerated are not called upon unduly; hence the favourable statistics of the children of the well-to-do Europeans in Calcutta, whose education and the facilities yielded by social position, enable them to adopt those precautions against the effects of a tropical climate, which are more easily put into practice, where there is an abundance of house-room, and a sufficiency of attendants, but which nevertheless are out of the reach of none: while the indifferently cared for children of the poor give a high rate of mortality from fever and diarrhœa during the earlier months of life, and the badly managed infants of the natives of Calcutta yield a terrible mortality.

Disadvantages after the age of five.

But when the term of infancy is over, the child participates more and more, as its life advances, in the disadvantages, under which the adult exists in India, till, after a few years, they are exceeded. The elder children therefore languish, or to some extent degenerate. What are these disadvantages? Categorically, they may be enumerated thus:—(*a*) a digestion slower

than in the European's natural climate, consequently (*b*) a lessened appetite, and therefore (*c*) slower nutrition ; (*d*) a generally relaxed state of the system ; (*e*) a tendency to poverty of blood ; (*f*) and finally, lessened mental and bodily vigour, because the wear and tear (waste), incidental to climate, are more considerable, while the supply (nutrition) does not replace the loss so rapidly as in a colder climate.

Other effects.

These are the more plainly marked deleterious effects ; but there are others which it is desirable to mention briefly. Heat of climate very materially affects the quality as well as the quantity of the food appropriated for nutrition, and not infrequently creates a morbid appetite for a class of food which may sooner or later, prove injurious. It is now known that the summer infantile diarrhœa of England is chiefly due to an alteration effected in the quality of the food, through the growth of germs, favoured by the sudden accessions of heat. With such accessions, the infant bills of mortality rise, in England, as certainly as does the thermometer. Every parent in India is aware also of the trouble there is to restrict children to their appropriate food ; how the light pudding is carefully eschewed, and highly flavoured meats clamoured for—a petition too frequently entertained. Another effect of the Indian climate to the predisposition to chill. By this is meant that very rapidly by evaporation and radiation the surface temperature of the body may fall with the result that some congestion of the internal organs,—the liver or intestines may occur, producing symptoms which may be slight or alarming, but all of which point to derangement of the function of the body. Hence we see how essential it is to adopt simplicity of diet, and to attend to the state of the bowels, these being the most potent, though the

CHAP. II.

easiest means of preserving the healthy action of the liver, the derangements of which cause ill-health and disease.

Plea for Anglo-Indian children.

Finally here we would make a plea for those children of Europeans who cannot at the age of 5 or 6 be sent home to Europe, that at least they should be sent to the hills to school and should remain there till well over the age of puberty, if they would escape that mental and bodily deterioration of which mention has been made. For there is no doubt that those children, who have been brought up properly and entirely in the hills of India are in no way inferior in mental or physical stamina to those reared in Europe.

CHAPTER III.

THE MOTHER'S HEALTH DURING PREGNANCY,

AND ITS EFFECTS UPON THE CHILD'S CONSTITUTION SUBSEQUENTLY.

THE mother's system yields nourishment to the infant before its birth. By bearing in mind the extreme rapidity of that child's development while still within the womb, and that no other material than the maternal blood is supplied to meet the whole burthen of growth, it becomes easy enough to understand the great influence thus exerted upon the constitution of the child ; but the extent to which it may suffer is either unknown, or is generally but very ill appreciated. Possibly it may be that while the influence of the quality of the blood is admitted, there is a difficulty in believing the readiness with which it becomes changed in response to the surrounding circumstances of the individual for as no mother would wittingly malnourish her child after its birth, it is hardly to be supposed she would commit a similar crime before it had been called into independent existence.

Subject not generally appreciated.

Under any circumstances the health of the pregnant European woman is, in India, liable to sufficient deterioration to cause it to be a matter of importance that she should adopt precautions more strict than are demanded in Europe.

Its importance.

The diet of the pregnant woman should be amply sufficient, but always simple. An unusual use of wine or beer is not only unnecessary but positively injurious. The capricious appetite, which attaches to the condition

Hygiene of pregnancy.

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of pregnancy, must not be yielded to. Moderate exercise, short of fatigue, should be indulged in. Riding, dancing, and all violent exercises, such as lawn tennis and badminton, of a straining nature should be avoided. Walking is beneficial. The legs may be used, but the arms should be spared. By straining at the games named, just as happens in lifting weights, the abdominal muscles are brought into sudden and jerky action, which obviously ought to be avoided. Late hours are to be eschewed. Rest in the horizontal position may be more freely indulged in than formerly. The bowels should be kept regular by means of diet, or, if necessary, by cascara or rhubarb. Such aperients as aloes and seidlitz-powders, as well as all patent medicines of unknown composition, are to be avoided as dangerous.

Dress.

The dress should be loose, so as to allow space for the growth of the child and to give a freedom to the mother's lungs sufficient to compensate for the increased upward pressure of the womb on her chest. It is not desirable that she should forego any of her usual occupations.

The perfect mother is placid and equable in temper, happy, good natured and active.

Surroundings.

Her life must be quiet, but her surroundings should be cheerful and bright. The dismal in thought and action must at all times be banned, for there is more than popular belief in the fact that mental impression have an effect on the child's development.

The breasts.

The breasts must also be cared for. As they increase in size and weight, a suitably arranged bandage or silk handkerchief will reduce the dragging sensation. The nipple for three months before birth of the child should be daily cleansed with Eau de Cologne and then rubbed with lanoline or if they are retracted they must be drawn out daily with finger and thumb.

Quinine.

Finally we would advise every mother in the plains to take daily 3 grs. tablet of quinine at dinner time during the last six months of her pregnancy: for by so doing the anxiety and danger of malarial fever is prevented, and moreover she need have no fear whatever of any untoward effect of the drug occurring when taken daily in such a small dose.

CHAPTER IV.

MANAGEMENT OF THE INFANT

AT AND IMMEDIATELY AFTER BIRTH.

Section I.—The First Day of Life.

An infant, let us assume, has been born without accident, and separated from its mother. The essential points demanding immediate attention are, care of the cord, warmth, and rest.

The cord having been inspected carefully to see that there is no oozing from it, the infant is to be rolled in flannel, which has been well warmed, and allowed to rest in the arms of an ayah or other warm place, while the necessary attention is being bestowed upon its mother. Warmth is at this moment of the greatest consequence, for the temperature of the newly-born infant falls several degrees below that which, during the rest of its life, will be natural to it, or which would subsequently be compatible with its vitality.

Warmth.

Rest, for these few minutes after the comparatively violent exercise of struggling and handling, is a good thing, though hardly essential so far as it concerns delaying the next operation, namely, the bath, should everything be ready for it; but which, if any case, after this interval, is (at a temperature of 100°) to be administered with *gentleness and rapidity.*

The bath.

If there is not a thermometer at hand, the elbow of the nurse immersed in the water will afford a fair test as to the appropriateness of the temperature. The hand should not be trusted to; it is not so sensitive as the thinner-skinned and habitually protected elbow.

Sometimes there is a large quantity of white sticky substance adhering to the child's skin ; sometimes there is but a little, almost always some. The complete removal of this substance is usually easily effected by anointing, with a little friction, those portions of the skin upon which it is seen, with warmed oil, lard, or butter. An emulsion is thus formed, which admits of ready removal with the sponge, soap, and water, while the child lies upon the nurse's lap, before immersion in the bath. Should it happen that all the white substance is not thus completely removed, no delay, or picking or rubbing, is justifiable in further attempts. Rapidity and gentleness are the really important points, and it is of no great consequence whether thorough dislodgment be effected ; but it is of moment that neither chill nor exhaustion be imposed upon the delicate organism which has been transported from the warm, dark, and still womb, into the midst of cold, noise, and light. A word of caution as regards the eyes, during this first bathing, is necessary. Scrupulous care should be observed that none of the soiled water be permitted to enter them, otherwise the infant may commence its life with an attack of ophthalmia. Indeed it is doubtful whether it is not best in every case to follow the advice of Crédé and place a few drops of a 1% solution of Silver Nitrate into the eyes immediately after birth, and then gently and carefully to cleanse the parted lids with some Boric Lotion. The process of drying and the application of dusting-powder are now to be proceeded with.

The eyes.

The arrangement of the navel-string next claims attention. The first thing to be done is to re-examine it attentively for a moment, and if there is any appearance of blood oozing from it, to apply a fresh ligature close to that which is already upon it.

The cord.

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Great care must be taken that the cord be not jerked or pulled through carelessness. From the centre of a piece of soft, clean rag, a portion is cut sufficient to allow the cord to be passed through it, and this having been placed in position, a strip of similar rag which has been sprinkled with the dusting-powder (16), to which a sixth part or so of Boracic Acid Powder had better be added, is to be gently wound round the cord, which should now be loosely coiled upon the flat piece which lies upon the abdomen. Over all a flannel binder is to be sewn with a wool-needle and cotton (pins should never be employed), and the process of dressing is to be completed. Then the infant should be wrapped in a soft woollen shawl and placed in its mother's arms, in close proximity to her body. Usually the baby will at this time fall asleep, and so remain for some hours. From such a slumber an officious nurse must not be permitted to awake it on the plea of giving it nourishment, or upon any other pretence. Should, however, there not be an inclination to sleep, the mother may at once apply the child to her breast, an act which will prove beneficial to herself and to her infant—to the former, by contributing to the contraction of the womb and stopping any tendency to bleeding; to the latter, by communicating warmth, and inducing the flow of nourishment.

Warmth

The circumstance of proximity to the mother was found by Dr. Crombie's observations to exert a marked influence on the temperature of the infant. The power of manufacturing its own heat has not yet been acquired. All the heat which can be safely spared has been parted with by the little body, which cannot create more, to be retained by the shawl and clothing. "The consequence of this is that the powers of the child are insufficient to raise its temperature above 94 or 96 degrees unless assisted by artificial warmth to be derived from the body of its mother. A great practical lesson underlies this subject, namely, the duty of the physician to see that newly born children, especially such as are weakly or premature, are

never left exposed unnecessarily to the air, even in a warm climate like this ; that they are warmly clad, even from the very first, and that they receive all the artificial warmth from their mothers possible. The feeble powers of the young infant may be just insufficient to raise its own temperature to a point compatible with the performance of the functions of life, unless aided by the instinct with which mothers are endowed, to lessen the radiation from the surface of their infants by contact with their own persons."

Another reason why the infant should be in proximity to its mother at this time is that it enables the ventilation of the room to be thoroughly carried out, a matter of the greatest importance to both mother and child. So long as the infant lies in contact with its mother's warm body, there need be no fear of its catching cold. The windows and doors may be thrown open with impunity, if only draughts be excluded and the cold is not excessive. As a rule, the lying-in chamber is kept much too warm, either for comfort or safety.

The mode of dress must be left to the previous ideas of the mother, but a protest cannot be out of place against the "fashion" which prescribes innumerable garments and which, to say the least, entails delay, unnecessary exposure, and fatigue at a moment when each and all of these should be avoided.

It is seldom, if ever, necessary to have recourse to any artificial means of nourishing the newly-born infant, though prejudice on the part of nurses often eventuates in an opposite course. "Seeing is believing," say they, and till the white fluid can be squeezed from the breast in quantity, it is concluded no nourishment is secreted. Thus has originated the popular belief that till the third day there is no sustenance for the child to be had from the mother. This is altogether an error, and a serious error. Nature has fully supplied all that is necessary for the wants of the child. "Small in quantity and

Breast secretion is sufficient.

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comparatively poor in quality as this provision admittedly is during the first two or three days after delivery, it is nevertheless amply sufficient for the purposes of nutrition." Not only is this so, but the early secreted fluid (for milk in appearance it then is not) is almost invariably sufficient to effect the removal of the black contents of the bowels, about which nurses usually express so much anxiety that they are unhappy if not permitted to drench the unfortunate infant, within a few hours of its birth, with purgatives. The secretion which is at first abstracted from the breast by the infant meets all requirements of nourishment and purgation ; sleep, warmth, and cleanliness being its only other necessities.

Aperients are injurious.

The castor oil which it is sometimes usual to administer to the newly-born infant is actually *injurious*, in that it acts as too rapid and too powerful a purge. It at once removes the whole contents of the intestine, part of which, it is intended by nature, should be absorbed into the blood, to contribute nourishment and heat to the body, pending the full secretion of milk and during that period of rest which is so much needed by mother and child. When castor oil has been wrongly administered, it is almost a necessity that some artificial food be given, because a premature appetite has been created by the removal of nature's provision. Restlessness follows as a matter of course, instead of that complete tranquillity which should be enjoyed. The infant is needlessly subjected to the risks and disadvantages of artificial food at the very moment when it is least fitted for an ordeal by which indigestion, flatulence, and perhaps bowel irritation may be induced. In short, the balance between nutrition and digestion is overthrown by interference, while the probable necessity for the further use of aperients is increased.

During the first twenty-four hours it is not necessary to put the child to the breast more than two or three times. Of course, when the napkins are soiled, they should be at once removed, and the parts cleansed and dried afterwards. Indeed, unless untoward circumstances arise, masterly inactivity will be found the best policy in these early days.

Section II.—Accidents and Unnatural Conditions.

But all may not go smoothly with the child. There are some *accidents which may happen at or immediately after birth*, and some unnatural conditions which, with their remedies, we now proceed to consider briefly.

Treatment of stillborn child.

I. A child may be apparently STILLBORN, or it may apparently cease to live very soon after its birth. Not a moment should be lost. A human life is in the balance, and let it be remembered that in seemingly the most hopeless cases proper and instant treatment is frequently rewarded with success. Proceed as follows :—

(*a*) Wipe out the back of the mouth, gently but effectually, by a deep sweep of the little finger round which a fold of a moistened soft handkerchief has been passed.

Rapid action necessary.

(*b*) If the child is still attached to its mother, ascertain by grasping the cord lightly between the forefinger and thumb whether there is any pulsation in it. If there is pulsation, do not divide the cord until the child has cried vigorously ; for so long as the cord beats, there is some circulation through the child's body, which may serve to maintain life till respiration becomes well established. At the same time dash a little cold water upon the face and chest of the infant, administer a few light but smart slaps, and with the fingers placed upon the lower part of the chest where the ribs separate, give an occasional jerk inwards, removing the hand suddenly each time. Should there

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be any delay in the commencing of breathing, while the child still remains attached to the mother, begin artificial respiration as below described.

Feeble pulsation.

(*c*) If the pulsation in the cord be so feeble as to make it almost doubtful that any exists, and if there are no signs of returning animation ; without hesitation put a double ligature upon the cord, divide it between the ligatures, and proceed as directed in the following paragraph :—

If no pulsation.

(*d*) If there is no pulsation, quickly ligature and divide the cord. Dash a little cold water on the face and chest of the infant, and smartly slap the chest and the buttocks. Plunge the infant for about half a minute into a warm bath (temperature 102 degrees or so) ; rapidly remove it from the water, and holding it by a finger hooked into each armpit, expose it to a current of air, by swinging it backwards and forwards two or three times, or plunge it straight from the hot water into a basin of cold water. It is important that it should only be in the cold water for a moment.

(*e*) If success does not attend these efforts, proceed at once to excite artificial respiration.

(*f*) If the after-birth has been expelled with the child, or if the separation has already been effected by the attendant, at once adopt the measures described in the foregoing paragraphs (*d*) and (*e*).

Sylvester's method of artificial respiration.

ARTIFICIAL RESPIRATION is conducted as follows :— Having cleansed the child's face rapidly and wiped out the back of the mouth, place the infant on its back on the bed, the head being thrown well back, and the chest elevated by a couple of folded napkins beneath the shoulders. An assistant should now draw forward the tongue with his fingers and so retain it between the gums. Standing behind the head, grasp each forearm, which should be well everted, *i.e.*, turned outwards,

the palms looking upwards and extend the arms upwards till they meet directly above the top of the head, thus causing an indraught of air by increasing the capacity of the chest (inspiration). Then bring the elbows steadily down to the sides again, bending them as they travel, and gently press them against the chest, which will be felt to bend in a little, thus expelling the air (expiration). Repeat these motions with about the rapidity of a child's ordinary breathing, until there is a natural attempt at respiration. As far as practicable, regulate the further movements in concert with the natural efforts which are being made, and do not desist till the respiratory function is properly established, and the child cries lustily and persistently. The feet should be steadied. See also that you do not perform the movements too quickly or let the babe's body get chilled. This is prevented by frequently immersing it in warm water. This is called "*Sylvester's method*," and as it is easily described and easily practised, it is mentioned to the exclusion of other methods, especially as some of the highest authorities confirm the writer's experience that it is the preferable and a very successful plan.

How long should these efforts at resuscitation be persevered in? The reply is,—not only so long as there is a sign of a spark of life, but for at least half an hour, even though there be no sign of success.

When vitality has returned, wrap the infant carefully up and place it upon the *right* side with the head and shoulders raised, and if it can swallow, administer five drops of brandy with water.

II. Swellings of the Scalp are not infrequently observed in the newly-born infant, and may occasion alarm. They are soft and puffy, and are caused by the pressure endured at birth. No treatment is required

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as a rule. These swellings are unimportant, and will generally subside of their own accord in a few days.

III. BLEEDING FROM THE NAVEL-STRING is to be treated by the application of an additional stout ligature placed a little nearer to the body than the first one.

Inability to suck.

IV. Should an infant appear to be unable to suck, it may be that the infant is too weak, or premature, or that it has a cleft palate or tongue tie. Should there be no immediate possibility of obtaining medical aid, the infant must be fed *by means of a spoon* with its mother's milk, or if this be not obtainable, with fresh cow's milk ($\frac{1}{3}$) and warm water ($\frac{2}{3}$) to which a little milk sugar has been added.

Tongue-tied.

Very few children are really tongue-tied. Do not therefore too quickly jump to the conclusion that such is the case, simply because an infant does not *readily* suck.

It may be concluded that the tongue is tied down when that organ cannot be raised from the floor of the mouth by passing the little finger underneath it ; when the string is seen to extend nearly to the tip of the tongue ; and when, the infant attempting to suck, the milk flows down the breast without entering the throat.

It may so happen that in an out-of-the-way district medical aid cannot be obtained. Only under such circumstances of urgent necessity is it justifiable for unskilled hands to undertake the *surgically* simple operation for its relief.

To operate, place the child in a good light in the sitting posture, its head being firmly held ; then take a pair of scissors, the points of which have been carefully ground off, and having lifted the tip of the tongue sufficiently to stretch the string, nip the latter slightly, the point of the scissors being held downwards away from the tongue. With the end of the finger gently tear through the remaining obstruction, and the operation is complete.

V. Should the BOWELS NOT BE MOVED within the first twelve hours of life, examine the fundament and gently introduce a piece of soap about the thickness of a slate pencil and 1 inch long. Should it be that the skin extends over the anus, and that no opening can be found, from surgical aid alone is relief to be obtained. Non-action of bowels.

VI. An infant may be born with a CLEFT PALATE; that is, the roof of the mouth is split from behind forwards. This condition requires great attention in the matter of feeding; there is not the slightest use in giving the child the nipple, or in attempting to use the feeding-bottle in the ordinary way. The child *cannot* suck; if it attempt to do so, the milk will get into the nostrils instead of passing into the stomach. Artificial feeding (Chap. IX) must of necessity be adopted, using an old-fashioned feeding-bottle, a piece being cut from the top of the nipple sufficient to make a circular opening about so large (O); the child should then be placed in the semi-erect posture, the bottle, about half full of the food, being at hand. The nipple should now be placed in the mouth, and the end of the bottle suddenly tilted up. Of course, the result will be a gush of milk down the throat. Almost instantly the end of the bottle is to be again lowered, and after a few moments' interval re-elevated, and so on. The feeding is to be conducted by a series of jerks. A spoon may be used, but it is troublesome and not nearly so effectual. Cleft palate.

An ingenious contrivance, which may be obtained from an instrument-maker, consists in attaching to the stalk of the ordinary nipple of the feeding-bottle an elastic flap cut to fit the palate. During suction this is forced back and forms an artificial palate, which prevents the fluid from entering the nose and enables the infant to suck.

By such means an infant with a cleft palate may be thoroughly nourished and kept in good health till

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babyhood has passed. Afterwards there will be no difficulty, and at two years of age the surgeon will be able, in the majority of instances, to remedy the defect, and even the age of six months is not too early for operation in some cases.

Passage of blood.

VII. PURGING AND VOMITING BLOOD. These formidable symptoms of the newly-born infant are fortunately rare, and when they do occur their duration is brief (26 to 36 hours). The quantity of blood vomited or purged—one or both—seems amazing. The danger is of course great, but a considerable number of cases (some 40 per cent.) recover, wherefore we may be hopeful. Let the infant be kept very quiet, apply moderate cold to the belly and warmth to the feet, feed with a spoon, and don't permit sucking. If there is much exhaustion give a little white wine whey (see "*Receipt*") or a few drops of brandy occasionally. As medicine give 1 grain of Gallic Acid every hour, and inject gently a couple of ounces of Infusion of Catechu into the bowel.

Section III.—After the First Day.

The first day of the child's life having been conducted in the way described, and the mother having assumed her natural office, the subsequent general management of the infant should be as follows:—

Care of navel cord.

It has been said that the first washing may be hastily performed, but this is not admissible with any subsequent ablution, which must be thorough and daily repeated. The word "ablution" is used advisedly in contradistinction to bathing, for the child ought not again to be plunged into the bath till the navel-string has become detached, the object being to preserve the string from contact with moisture, which in India will

cause it to smell abominably ; besides which, moisture has the effect of prolonging its retention for some days. If the string be perfectly protected from water, it will soon become hard, dark-brown coloured, as dry as a chip, without the faintest odour, and it will usually fall off on the third day. It is a good plan to sprinkle the dry and shrivelled cord with a little Zinc and Boric Acid dusting powder, or wrap it in Boracic gauze or wool. It is most important to keep the cord sweet and dry. Dangerous illness not unfrequently arises from an offensive (septic) cord.

The infant should be suckled three or four times on the first day and at intervals of four hours on the second day, after which it should be nursed regularly every second hour during the day ; and twice during the night for the first month ; and no accessory or artificial food should be given whatever.

Breast feeding.

On the following page is a Table of Breast Feeding which should be scrupulously adhered to both for the sake of the mother as well as for the child's health.

The bowels will probably be relieved three or four times each day. On the second day, the evacuations will become of a yellowish colour, the black matter having been for the most part purged off by the first milk ; but whether this be completely so or not is a matter of no importance though it may be urged by the nurse as a reason why the castor oil, which previously had been objected to, should be now administered. In very exceptional cases, where the mother's milk does not possess the requisite aperient properties, it may be advisable on the third day to allow half a small egg-spoonful of castor oil mixed with warm water, to which a couple of grains of Carbonate of Soda have been added. By this time the conditions which before rendered a purgative directly injurious will have passed away.

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Breast Feed Table.

Age.	Number of Feeds in 24 hours.	Interval.	During night.
1 month ...	10	2 hours ...	2
2—3 months ...	8	2½ ,, ...	1
4—5 ,, ...	7	3 ,, ...	1
6—9 ,, ...	6	3 ,, ...	0

It may here be remarked that during the whole course of a human life there is no period at which thorough ventilation is so much needed, and is of so great importance to vitality (both of mother and child), as it is during these early lying-in days.

Cleanliness.

The early removal of all fouled linen and evacuations of both mother and child is a matter of much importance, and one which, if neglected, is calculated to affect very injuriously the health and life of the child, more especially in small apartments. There are certain diseases to which the infant is liable under insanitary conditions, particularly in a hot climate, during the first ten or twelve days of its existence, which are known to be the direct effects of foul air and dirt; for instance, the native infants of Calcutta die largely from lock-jaw (tetanus), an almost hopeless condition, which is all but unknown among the European infants of the city, and which is the direct produce of dirt, foul air, and insufficient ventilation.

Ventilation.

Warmth is still very essential to the infant's well-being; it must not be the warmth of foul air, but the imparted heat of the mother. Foul air will not impart heat, nor will fresh air cause colds or chills. Foul air is at this time a most effectual poison; fresh air conveys life and health, and by increasing the

vitality, greatly helps to augment the production of natural internal heat.

Jaundice.

Very frequently an infant's skin becomes of a yellowish colour about the third or fourth day of its life. The colouration may deepen for a day or two, and then it will as gradually subside. This condition is not one of real jaundice, but is due to the changes which the blood is undergoing in the over-congested skin and is of trivial importance, requiring no treatment. There are, however, forms of jaundice of serious import which occur within a few days of birth.

Breasts of infant.

Sometimes the breasts of the infant enlarge four or five days after birth. A small quantity of milk is secreted, and can be squeezed from the nipple. The occurrence is as frequent in males as females, and may continue for some weeks. In almost all cases, if left alone, subsidence will take place gradually, without giving any trouble ; but if squeezed or pulled about by an ignorant person, inflammation and even abscess may be caused.

Vaginal discharge.

A slight bloody discharge from the vagina of a new-born female infant is generally of no importance, and will very soon cease.

Neck swelling.

A hard swelling about the size of a cherry is occasionally met with and noticed a couple of weeks after birth. It may cause the infant to bend the head to one side, and has probably been caused by stretching or even tearing of the muscle which goes from the top of the breast-bone to behind the ear. In the great majority of cases it disappears with time.

Paralysis.

An arm is found to hang loosely at or soon after birth in a small number of cases. This is known as Erb's paralysis. Many recover completely in a few months, but occasionally more or less paralysis may

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remain, and the full development of the limb be retarded.

After the cord has separated, bleeding may occur from its stump, generally only an oozing, but it may be more profuse. Astringents should be applied locally (tannic acid, matico, etc.), and use gentle pressure. Should the bleeding be more than the merest oozing, surgical aid should be summoned.

CHAPTER V.

NURSING AND TOPICS RELATIVE TO IT.

As during the next six or seven months of its life the infant should depend wholly upon its mother's milk for its nutriment, this is the proper place to say a few words concerning "nursing."

Care of mother.

I have never known injury to be inflicted upon a mother's breast by the application of her infant before the white milk was to be seen ; or, as soon after birth as possible. The mother should not partake of much fluid till the sense of distention of the breasts has passed off, but when the infant has been sufficiently early applied, there is seldom any trouble on this score. The relief of her bowels daily, by the assistance of simple warm water injections, will materially tend to lessen the likelihood of such an occurrence ; it may, however, be sometimes necessary to employ fomentations and gentle frictions, aided by oil, to relieve a painful hard breast. The frictions should be very lightly performed, the hand barely touching the skin when passing from the nipple towards the edge of the breast, but being pressed with gentle firmness when travelling in the opposite direction.

Regularity in Breast-feeding.

Regularity in following out the Breast-feed Table given on page 30 will do much to keep mother and child in good health ; for the continual application of the child to the breast weakens the mother by the abstraction of more than Nature intended to yield, and deprives her of rest. It does the child no good ; on

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the contrary, it brings on indigestion, rejection of milk, flatulency, and diarrhœa from over-feeding. The mother should try to teach her infant not to feed so frequently at night as during the daytime, wherefore, if for no other reason, it should sleep in a separate cot. "The more crying the more feeding, and the more feeding the more the infant cries, and what between crying and suckling the day and night are spent in misery," as Goodhart quaintly puts it. "These are the cases which form the great majority of the thin, pining, pitiable mites who are brought to hospital for 'consumption of the bowels,' but with bad feeding only to blame."

"An infant should not receive its nourishment lying down" (Dewees). The semi-erect posture is the proper one to adopt; exactly that position in which a mother naturally places her child when she sits in a chair, nursing. The muscular power of swallowing is, in the infant, very feeble, but by the semi-erect position we avail ourselves of gravitation; the child, when so placed, actually obtains more nourishment, and the apparently causeless rejection of milk is then less frequent.

Diet of mother.

As to the food the mother should use during nursing; she should abstain from very few things, and be careful to use a variety. Of course, during the lying-in period, the usual simple diet should be employed, but of this I say nothing. Subsequently she should eschew hot curries and highly seasoned dishes of all kinds, salads, radishes, and uncooked vegetables generally, lobsters, tinned provisions generally, and an excess of solid meat.

She should be particular to partake of a sufficiency of vegetables and good fresh meat. There is a prejudice on the part of nurses against vegetables, particularly

potatoes. Such folly is based upon ignorance—indeed, we may term it dangerous ignorance. A nursing mother differs not from the rest of humanity as to the laws which govern the physiological process of nourishment, and these declare that if fresh vegetables be excluded, or even very sparingly partaken of, a scorbutic taint of the blood is engendered, which impairs, more or less, the general health, unfitting the mother for suckling, and rendering her milk unwholesome for her infant. Many times by this advice a mother, who never before had done so, because she had previously held fast to the theory of the necessity for excluding vegetables, has been enabled to nurse her child, with perfect health to herself and infant. With such an unfortunate conviction is allied another, namely, that it is essential during nursing to consume a considerable proportion of beer or wine. It is alleged that milk is thus created, and the drain of nursing upon the system is urged as a reason for the necessity of "support." Spirituous liquids *do not* lead to the formation of milk in any degree whatever, and their use in no way compensates for the lack of a proper admixture of food in the diet; nor is it true that nursing is a drain upon the health of any moderately healthy woman—on the contrary, it is known to be beneficial, and that women generally improve in health during its progress. A nursing mother requires, it is true, more fluid than others. She is frequently thirsty. To relieve this thirst, she should drink gruel or barley-water, or milk-and-water, which, besides being drinks, are really nutritious, and therefore milk-forming. Thorough nourishment of the system is certainly demanded, but she does not need extra stimulation, which may render her feverish and deteriorate her milk. The usual glass of wine, ale, or stout need not

The importance of suitable diet.

Fluid necessary.

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be denied at dinner-time and also at tiffin if desired, but such an allowance is ample ; more is injurious.

Menstruation during suckling period.

Should a mother happen to menstruate during the suckling period, it is an unfortunate occurrence ; but it is not one which should prevent her continuing to nurse, unless the ordinary period of weaning be at hand. Usually, the infant, during the days the function continues, will show some signs of indisposition, generally slight, but which, if at all severe and recurring, proclaim the mother unfit to continue her office ; otherwise it is unnecessary that she desist.

The European mother is usually able to nurse for about eight or nine months, if she takes care of her health ; but a robust native nurse may often be permitted to continue her duties for a full year.

When unfit to suckle.

Sometimes it happens that a mother is unfit to suckle her infant. (1) Severe constitutional debility, the result of malarial fever or the influence of the climate, may be a justifiable cause for non-compliance with the dictates of nature, but fortunately it is not a frequent reason, for the general health usually improves during nursing, and the alleged "drain" upon the system is a fallacy in most cases. Sometimes, however, it will prove a reality. Because there have been occasional attacks of ague, or because the system is a little below par, is no sufficient reason that nursing should not be continued ; but the debility may be such that the quality of the milk is much deteriorated and unfit for the child ; or there may not be sufficient glandular activity to supply enough fluid ; or, being supplied, there may not be sufficient general inherent vitality in the mother to compensate for the loss. Except where the debility is considerable and of long duration, the effort is not only justifiable, but it is a duty. A trial should at least be made. (2) A mother who is subject

to epilepsy or other violent paroxysmal nervous disorders should not nurse, both for her own sake and that of her child. (3) Abscesses of the breast, if severe, compel non-nursing. (4) The continual recurrence of intermittent fever is also a fair cause for desisting. (5) The occurrence of pregnancy is opposed to good nursing. The quality of the milk then greatly deteriorates, the mother's system not being able to nourish both the babe at her breast and that in the womb at the same time. (6) If after a fair trial it be proved that the secretion of milk is too scanty to be practically of any use, there is no object in continuing it, but unless the mother be prepared to obtain the services of a wet nurse, it is her duty to continue to give what nourishment she possesses, provided her own health do not suffer. Even such very partial feeding increases the chances of the child's life. (7) The nipples may be so retracted as to present a serious difficulty. This point should have been attended to before confinement, otherwise the obstacle may be great; but suction, or the use of a "nipple shield with elastic tube," will usually remedy the defect, if properly employed. Very seldom should this cause be permitted to conquer and to drive the child from its mother.

Retracted nipples.

Assuming it to be decided that the mother, from one or other of the foregoing causes, is unable to suckle her infant, there remains but the choice between a wet nurse and artificial feeding. That the advantages of the former are incomparably greater will presently (Chap. VIII) be shown. We are therefore led to consider the question of the selection of a wet nurse. It is a matter for congratulation that in India the much-discussed disadvantages connected with this class of servants are reduced to a minimum, as compared with England. A

Wet nurse.

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wet nurse should be (1) young but not youthful,—never under 20, seldom over 30. (2) In good health; well nourished, with a sleek skin, free from all eruptions or appearance of former eruptions; free from enlargement of the spleen; possessing a good set of teeth; a clean tongue; red, not pallid, gums; sweet breath, and freedom from enlarged glands in her neck. (3) The date of her confinement should approximate that of the age of the child she undertakes to nurse.

How to choose.

This is of importance, for the milk varies in nutritive properties in definite proportion to the age of the child. The milk of a woman whose child is 6 months old, even though she have plenty of it, is not fit nourishment for a baby of 3 or 4 weeks of age. It contains too much of some constituents and too little of others.

(4) The breasts of the candidate should be firm and plump, not hanging loosely down, and should contain a good supply of milk of a bluish colour, and which on standing should yield a cream.

"The best test of the goodness of milk," observes Dr. E. Smith, "is derived from observation of the child. He should be watched while at the breast, and if he sucks vigorously, finishes the meal with the milk running down over his lips, and requires suck but five times in the day, we may infer that the milk is sufficiently abundant. If, on the other hand, he constantly requires the breast, sucks laboriously and with effort, occasionally desisting, and crying peevishly, the milk is probably scanty. As an additional test the infant may be weighed immediately before and after taking the breast. The increase in weight should be from 3 to 4 ounces, according to age."

(5) If the woman be menstruating, she should be rejected. (6) She should be of a patient and cheerful disposition.

Enquiries be made.

Enquiries should be made (1) into her previous history, concerning any illnesses she may have had, whether she ever suffered from any sickness which involved prolonged sorethroat, eruptions of the skin, or ulcers. If such be the case, she should be rejected.

(2) Concerning her husband and his health, present and past, the enquiries last-named should be instituted. (3) Inspect the woman's infant, assure yourself that it is hers and not a borrowed one, consider its age with regard to her statement upon the point, observe whether it presents a healthy appearance generally, and be particular to notice whether there are any sores between the buttocks or at the corners of the mouth. The presence of such sores would call for immediate rejection of the candidate. (4) Let particular enquiry be made as to whether the woman is in the habit of smoking *ganja* or opium ; should either be the case, she should be rejected. (5) Under inspection, the breasts should be emptied by her own child, or artificially, and the woman directed to present herself again after the lapse of a few hours, in order to ascertain whether she really possesses a sufficient supply of nourishment, and that she has not attempted fraud by having permitted a large accumulation.

With due attention to all these points, a wet nurse having been selected, her future management becomes of importance. In the first place, she should have a warm bath and wash thoroughly all over, after which, and when clad in clean warm clothing, she may commence her duties. The next thing is to be careful not to overfeed her, or even to place her too quickly on a liberal diet ; but to have due regard to her previous diet and mode of life. By sudden overfeeding, the milk may very greatly diminish, or become of such a character as to be injurious. Let her be employed as much as possible in general household duties to ensure a proper amount of exercise, and cause her to move about occasionally, with the infant in her arms, to provide for its exercise. A wet nurse is too frequently allowed to moon away her time in idleness. She is then apt to lose her

Care of wet nurse.

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milk, indigestion will set in, she will become feverish and her milk unwholesome and irritating. To violent exertion she should never be subjected (p. 49). Do not allow the child to sleep with the nurse at night. See that regularity as to its meal is observed, and that it be not continually hanging on to the breast. Hot curries, chutnies, or too much meat must not be allowed to the nurse. Be very particular that vegetables constitute a due proportion of her diet. Allow her plenty of sleep. Be sure that the woman's own child be kept at a distance, lest she devote part of her nourishment to it. The cost of a wet nurse is not greater, hardly, than artificial feeding. The Civil Surgeon of Agra has a list of a large number of wet nurses, and one will be supplied in a few days, after telegraphic application has been made to him. When it is necessary to "teach the bottle" to an infant, because intermittent fever or other derangements are likely to unfit a mother, or nurse, the following method should be adopted for suckling. A dessertspoonful of milk with 4 or 5 of warm water and a minute portion of sugar, given through the bottle once or twice a day, will effect the needful education, which, if not commenced gradually, will be accomplished subsequently only with great trouble and delay. The modern *feeding-bottle* without tubes of any kind is to be preferred, because it can with great facility be thoroughly cleaned, any particle of old food adhering to it being readily seen, except if concealed in the nipple, which should always stand after careful washing, when not in use in a solution of boracic acid 3 grains to the ounce of water, and the bottle itself should be rinsed out with the same solution and because it ensures due attention to the process of feeding on the part of the nurse, who is compelled to hold the bottle in her hand all the while.

Where and how obtained.

Teaching to Bottle-feed.

In exceptional cases the mother's or nurse's milk does not seem to suit. The infant becomes fretful and griped, and its rest is very disturbed, while at the same time there may be either vomiting, diarrhœa, or constipation. In such a case the milk may be too heavy for the child's digestion. It will not be sufficient merely to diminish the quantity by alternating meals of other forms of food, for still the pure milk has to be disposed of. A good plan is to give half a meal of barley-water (see "*Receipts*") from the bottle immediately before putting the child to the breast, with the object of diluting the milk when it reaches the stomach. A few grains of bicarbonate of soda may be given after each meal. If the child be a "bolter," the simple expedient of supporting the breast with the hand, and compressing the base of the nipple between the fingers, will retard the flow. On the other hand, the mother's milk may be too poor and watery, though abundant. Then the child constantly demands the breast, because he is always hungry, and generally cross, uttering an angry cry when put to the breast, where he finds only disappointment, and rejects the nipple in a few moments, no matter how frequently offered. It will then be necessary to alter the mother's habits, by placing her on a more liberal diet, ensuring her more perfect rest, perhaps allowing her a glass of ale or stout, and administering malt extract or other food tonic; or to change the nurse, or supplement the breast milk by some other form of suitable diet (Chap. IX). It is said, and apparently with truth, that when an infant, who is not thriving, sleeps much with the nipple in his mouth, and only then, it is a sign of watery milk. The reader is referred to Chapter IX for further information upon the subject of milk disagreeing with the infant.

When breast milk disagrees.

Too rich.

Too poor.

CHAPTER VI.

THE PRINCIPLES OF DIET.

AS APPLICABLE TO CHILDHOOD—MILK—CONDENSED MILK—FARINACEOUS FOODS—INTERMEDIATE FOODS—WATER.

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Principles of diet.

HENCEFORTH it will be impossible to follow the child's life step by step. We must therefore consider each point involving its existence in detail. To enable the parent to understand the proper mode of feeding her child, it is desirable to state briefly the general principles of diet as applicable to the infant.

Every human being, whether infant or adult, must consume not only nourishing food, but he must have a proper admixture of the different elements of food, or alimentary principles, as they are termed. Bread, for instance, is a food, but it is not an alimentary principle ; on the contrary, it contains some of all these principles. A pudding is a food, but we know that it has been made with so much flour, so much butter, so much fruit, etc. Any one article of food which can be named is just as much a mixture as is a pudding. Milk is as simple a food as can be conceived, yet in reality it is a complex mixture of the different alimentary principles. We know that it contains a quantity of water, which is an alimentary principle ; that it contains fat (termed butter), which is another principle ; that it contains curd, which is another, and so on. The same holds good of bread, or beef, or

vegetables, and all other foods. This is what is meant by alimentary principles.

Classification :—

- Organic
  - Nitrogenous
    - Proteids,* *e.g.*, casein, gluten.
    - Albuminoids, *e.g.*, gelatine.
  - Non-nitrogenous
    - Carbo-hydrates, *e.g.*, sugar, starch.
    - Fats, *e.g.*, butter, olive oil.
- Inorganic
  - Mineral matters, *e.g.*, sodium, potash, lime, etc.
  - Water.

Function of constituents.

As to the functions of these nutritive constituents of food, they are of two kinds. The *first* is that of building up and repairing the tissues. This can be done by the proteids and the inorganic materials, and by these alone. But the *second* function, that of work and heat production (energy), is shared by all the organic constituents, and helped somewhat by the inorganic.

Of each and all of these, humanity must have a definite proportion in its food. Instinct of the appetite guides the healthy individual, but the infant is provided, in its mother's milk, with the exact alimentary proportions necessary for its perfect nourishment. Human milk, for instance, contains in 100 parts, roughly speaking, $3\frac{1}{2}$ to 4 parts of the nitrogenous principle, 3 of fat, 4 of sugar, $\frac{1}{4}$ of a part of mineral matters, and 89 parts of water.

As life proceeds, the proportions requisite alter greatly, so that in ratio to its weight the child of ten needs three times as much fats and carbo-hydrates as the adult, and six times the proportion of albuminous nutriment. Again, the child requires a greater proportion of food relatively to its size than the adult,

* Proteid, or "pre-eminent," because the proteids alone are able to fulfil both the functions of a food, and without them life is impossible.

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because of its extremely rapid growth, by which much nutriment is utilised for the building-up process; because the waste consequent upon the ever-active life is great; and because respiration, which is one of the chief means of combustion or consumption of material, is especially active in childhood.

Proportions alter with age.

These conditions change further with age; hence the qualities of the food must also change. An adult, for instance, could not be wholly fed upon milk, because to enable him to obtain a sufficiency of albuminous aliment he should consume not less than 11 pints daily, and then the amount of fat would be greatly in excess.

Effect of improper proportions.

A human being cannot exist upon any one class of aliments, nor yet upon any three to the complete exclusion of one. If an animal be fed exclusively upon any one for a length of time, its health will rapidly become impaired to such an extent that even a return to its natural diet may not save its life. Similarly, if inferior milk be given to an infant, or if the artificial milk-food be improperly prepared by too much or too little dilution or otherwise, it follows that evil results will assuredly ensue, because there will be excess or defect of some one or more of the ingredients.

The function of the mineral matter.

The mineral matters are compounds of lime, soda, phosphorus, and potash, and are of great importance in the vital process, as they are especially concerned in the currents of nourishing fluids which pervade every part of the body, including the glands of the breasts, which, without their aid, would not be able to secrete perfectly; hence, as before stated (p. 48), the mother who excludes vegetables from her dietary runs the risk of losing her milk and impairing her health, while she denies her infant those numerous mineral

ingredients which are essential to its perfect nutriment, and which should be largely supplied to her blood and her milk, through the judicious use of proper vegetable food.

MILK.—In all kinds of milk the five alimentary principles exist, though in very varying proportions. It is, therefore, evident that the young of animals fed upon each kind in reality obtain a wholly different sort of food, and it requires no argument to prove that the milk of one is therefore an unsuitable food for the young of another. Comparing the milk of the cow with that of the woman, we find that, while the amount of water is less, that of the solids is much greater, the fatty, saline, and nitrogenous matters being in excess while the sugar is diminished.

HOW TO "HUMANIZE" COW'S MILK.—By diluting cow's milk the albuminates and salts can be made to equal those in human milk ; but, by doing so, the quantity of sugar is still further diminished, and the amount of fat also becomes deficient. If, then, we adopt this method of dilution, it is evident that we must add a certain amount of both sugar and fat to the diluted milk, to bring the resulting mixture up to the standard of human milk, and make it a suitable food for the infant to thrive upon. Herein lies the difficulty, and many ingenious, and scientific, methods have been devised upon these lines. Absolute accuracy in adjustment is beyond the resources of the ordinary nursery; but, by adhering, approximately, to the tables given below, sufficient accuracy can be obtained for all practical purposes.

Humanize cow's milk.

There are other important differences that must be attended to if success is to be obtained. These differences are : human milk is alkaline in reaction, cow's milk is acid ; human milk sterile, or free from germs,

cow's milk is crowded with micro-organisms, and may contain those of disease ; cow's milk coagulates in the infant's stomach in large, indigestible clots, whereas, human milk forms loose, flocculent, easily-digestible curd.

The micro-organisms in cow's milk can be destroyed by sterilisation (to be described later on). The curd can be broken up, and altered, so as to render it like that of human milk, by the addition of barley water, gelatine, isinglass, or lime water. The first three of these substances act mechanically by getting between the drops and preventing them from coagulating in one large mass; the lime water probably acts in a different manner, by partly neutralising the acid of the gastric juice, in virtue of its alkalinity, so that the milk is coagulated gradually, in small masses, and passes on into the intestine, where the digestive juices are alkaline.

The acidity of the cow's milk can be corrected by lime water and citrate of soda ; and it requires, as a rule, one teaspoonful of lime juice or two grains of citrate of soda to each ounce and a half of food, to produce this effect. The food should be tested occasionally, with a piece of red litmus paper, to see that it really is alkaline ; if the paper turns a faint blue colour, when dipped into the milk, the reaction is alkaline. To alter cow's milk, then, so as to make it resemble breast milk, it is necessary :—

1. To dilute it.
2. To add sugar and fat (cream).
3. To add some substance to prevent the formation of large clots.
4. To render it alkaline, and
5. To sterilize it.

Thus, a 1½ ounce (second week) feed will be made up as follows :—

Milk ...	... 4 teaspoonfuls
Water ...	... 7 ,,
Lime water	... 1 teaspoonful.
Citrate of soda	... 2 grains.
Milk sugar	... 10 ,,
Cream ...	... 10 drops.

The Diluent.

Lime water, in so far as it fulfils the requirements 1, 3 and 4, would suggest itself as most useful ; but, unfortunately, it is prone to cause constipation, or, if used for a long time, to set up irritative diarrhœa. For these reasons *thin* barley water, which fulfils requirements 1 and 3, is usually preferable, the alkalinity being arrived at by the addition of citrate of soda.

The additional fat is added in the form of cream.

Cream.

Cream.—As a supply of good cream is not always easy to obtain, it is best to have the means of producing it at home. Cream is often spoken of as something quite different from milk, whereas it is, in reality, nothing more than milk that contains an excess of fat. Good cream can, of course, only be obtained from good milk. For the purposes of infant feeding, the mixed milk, from a herd of cows, is preferable to that of one cow, whose milk is liable to constant changes and consequently to disagree. The mixed milk is an average milk of practically uniform composition. Milk should be from a safe source, and unadulterated with water, thickening matter, or any preserving material.

The proportion of fat in cream depends, within limits, upon the time the milk is allowed to set before being skimmed. Thus, from good milk, allowed to stand for 12 hours, the skimmed cream contains about 16 per cent. of fat, and is known as "gravity cream."

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The cream from milk that has stood a shorter time contains a smaller percentage of fat.

For infant feeding, cream containing about 10 or 12 per cent. of fat is the most suitable.

A convenient method of obtaining cream is the following :—

A cylindrical tin can, capable of holding a pint, or more, of milk, is fitted with a slightly sloping bottom, a lid, and a short spout let into the side at the lower end. It is divided, by marks on the inside, into four equal parts. To the spout is attached a couple of inches of rubber tubing, with a wire clip to keep it closed (a safety pin answers the purpose admirably). The whole apparatus can be procured for a trifling sum.

The milk—fresh and strained—is placed in the tin, the lid is closed, and the apparatus put aside in a cool place, or, in an ice box in the hot weather ; after standing for about six hours the rubber tubing is slowly unclamped, and the lower three-quarters of the milk allowed to flow off ; the remaining quarter, now at the bottom of the tin, is the cream, containing about 10 per cent. of fat, and is retained for use in the food.

Barley water.

THE BARLEY WATER is made in the following way:—

Put two teaspoonfuls of pearl barley into a clean enamelled saucepan and add a little water ; boil rapidly for five minutes and throw off the water. Then add a pint of filtered water and boil slowly down to two-thirds of a pint and strain through muslin that has been wrung out in boiling water.

Another receipt is : Grind up two teaspoonfuls of barley. Place it in a jug and pour on it, while stirring, a pint of boiling water. Stand the jug near the fire for an hour, stirring occasionally, and then strain through muslin and add a pinch of salt.

Barley water should be made fresh each day, and, in the hot weather, twice a day, if necessary.

COMPARISON OF HUMAN MILK WITH THAT OF DOMESTIC ANIMALS.

	Human.	Cow's.	Ass's.	Goat's.
Proteid { Casein ...	0·6	3·25	1·0	3·0
Proteid { Lactalbumen ...	1·4 } 2·0	0·75 } 4·0	0·8 } 1·8	0·7 } 3·7
Fat	3·5	3·5	1·0	4·2
Sugar	7·0	4·0	5·5	1·0
Mineral matter ...	0·2	0·7	0·4	0·5

Ass's milk.

It is usually believed that ass's milk is the nearest in quality to that of the woman, but this is an error. It contains more water, is much poorer in curd and butter, and has an excess of sugar and salts ; but it is sometimes very valuable for children who are too delicate to bear cow's milk, because it is very easy of digestion, though sometimes it causes diarrhœa owing to the amount of salts in it. It also possesses distinct laxative properties, which may not always be desirable. If a healthy infant be fed upon ass's milk, a much larger quantity will be needed to make up the requirement of butter and albuminous substances, but then the salts and sugar will be much in excess. Ass's milk, therefore, is not an appropriate food for a healthy infant. The addition of cream would remedy the chief defects, but cream is not easily obtained in India.

The milk of the cow is the closest approximation, though the proteids and salts are in excess, as shown in the above table.

Goat's milk.

Goat's milk contains a large proportion of curd, and the salts are in excess. Still, this milk may

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be used with advantage for the rearing of children who possess good powers of digestion. But the goat is a very promiscuous feeder, and it is well known that the nature of the food greatly affects that of the milk. It is quite familiar to every one that purgatives administered to a nursing mother will readily produce an effect through her milk upon the infant's bowels. Hence it is needful that a goat whose milk is used should be tied up within the range of only wholesome food. Neglect of this precaution has led to a prejudice against goat's milk, which is frequently found to produce irritating effects when the animal is allowed to wander about.

Testing milk.

Examination of milk.

Lactometer, faulty means.

Hydrometer.

FIG. 1.

Examination of Milk.—The lactometer is usually relied upon by the public as a means of judging the quality of milk, but it is a faulty instrument, because, although it may in the cold weather sink to the letter M, which is supposed to indicate that the milk is pure, the very same quality of milk in hot weather will appear, when tested by it, to contain 15 or even 20 per cent. of water. It is better, therefore, to use the hydrometer (Fig. 1) (which is the same instrument, except that in the place of a letter indicating the purity of milk, and figures representing that so much water had been added, there is a scale of figures from above downwards—0, 10, 20, 30, 40 and 50, between which there are graduations indicating units), and to apply a correction for temperature, which Parkes gives as follows :—

39° F. = 1031	80° F. = 1027½
60° F. = 1030	90° F. = 1025½
70° F. = 1029	100° F. = 1024

That is, at any of these temperatures the hydrometer will mark the specific gravity as above, if the milk be pure ; but if the specific gravity, as read on the hydrometer be lower, it is an indication that water has been added. If, for example, the temperature of the milk is found to be 65°, and the specific gravity to be 1025, we know that a considerable quantity of water has been added, though had the temperature of the milk happened to have been blood-heat, the above specific gravity would indicate purity. In this example, we see by reference to the table that the specific gravity ought to have been 1029½ instead of 1025, which represents a loss of 4½, showing that 15 per cent. of water has been added, as the next paragraph explains.

There is a loss of 3 degrees as marked on the hydrometer for every 10 per cent. of water added when the temperature of the milk is about 60 degrees.

Thus pure milk will mark						...	30*
Milk diluted with about			15	per cent.	of water	...	26
,,	,,	,,	20	,,	,,	...	23
,,	,,	,,	35	,,	,,	...	18
,,	,,	,,	45	,,	,,	...	15

When milk has been skimmed, even though it may be diluted with water, the specific gravity will be higher, and similarly a milk which is particularly rich in cream will show a lower specific gravity. Hence another source of fallacy in this method of estimating the quality of milk. As a matter of fact, chemical analysis is the only reliable means.

Another very simple plan is to gum a piece of paper, which has been marked into 100 equal parts, to the outside of a long glass tube, the lower numbers being uppermost. Fill it with the milk to be examined, and allow it to stand for 12 hours at least in a place sheltered from all wind. The cream will rise to the surface, and the number of degrees (that is, the percentage) occupied by it may be read off. Usually it ought to occupy 8 to 11 degrees. Macnamara objects to this test

* These numbers are to be read as 1030, 1026, etc., water, which is the standard, being 1000, and marked 0 on the scale.

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for India, because the climate causes such quick coagulation of milk that it prevents the cream rising rapidly, but in the cold weather the objection does not apply.

Cow's milk acid.

Cow's milk ought to be faintly acid, and this is ascertained by dipping into it a scrap of litmus paper, which is of a blue colour, but which will turn pinkish if it be moderately acid, and red if very acid ; the latter condition indicating commencing fermentation and necessitating the rejection of the milk. Of course, if chalk has been added, the litmus paper will not change colour ; a sick cow will also usually yield alkaline milk. Woman's milk, on the contrary, is alkaline ; it will never turn litmus paper red. For this reason before cow's milk is given to a baby, it is usual, indeed it is necessary, to add a proper proportion of limewater to it. This removes the acidity, a fact which should be verified by the use of litmus paper, some of which should always be kept in the nursery.

When it is desired to ascertain the quality of milk with an approximation to accuracy, all three tests—(1) litmus paper, (2) specific gravity, and (3) the amount of cream—should be combined to yield a correct result.

It is well known that milk will soon curdle if it be exposed to hot weather, or if it has been kept in a vessel which contained any traces of former milk which had turned sour ; but the housekeeper may sometimes be sorely perplexed by the fact that milk, which has been seemingly all right, upon being boiled curdles and becomes unfit for use. Now this is accounted for easily

Fermentation.

enough—fermentative change has already commenced, and the lactic acid thus generated is insufficient to produce a manifest effect at ordinary temperatures, but it is sufficient to do so at a greater heat. Such an occurrence, therefore, argues that the milk has been in contact with an impure vessel, or that the boiling has

been delayed till the weather has had time to commence fermentation. Milk which behaves in this way is unfit for an infant.

Travelling.

For a journey, diluted condensed milk,—as a temporary-food,—possesses some distinct advantages. It is usually sterile and is easily digested. It should be diluted twelve times for infants under one month, *i.e.*, one teaspoonful of condensed milk to three tablespoonfuls of water, and one teaspoonful to two tablespoonfuls of water (one in eight) for older babes.

Milk may be preserved for a short journey by boiling it, adding sugar, and while hot putting it into very clean bottles, which should be quite filled. Then and there the bottles should be corked and sealed.

It is always advisable in this country to kill off the micro-organisms that may have contaminated milk from any source. This is done by boiling, but it is thought that milk which has been boiled "sterilised" does not possess quite the same nutritive value to the young infant as raw milk, and there is evidence in this direction. *Partial* sterilisation, by the process known as *Pasteurisation*, is sufficient and easy to carry out, and has not the disadvantages of prolonged boiling.

Pasteurisation milk.

By this process the milk is not actually boiled (212° F.), but is raised to a comparatively low temperature of from 140° to 147° F. for 30 or 40 minutes. This temperature does not give a taste to the milk in the way that boiling does, nor produce some other undesirable changes that occur when a higher temperature is employed.

Pasteurised milk will not keep indefinitely, and, consequently, when travelling, it is better to boil the milk for half an hour. Cooking milk distinctly impairs its utility, but any loss in this direction is more than compensated for by the destruction of the germs that

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might cause serious illness, or even death, if taken into the stomach.

Soxhlet Apparatus.

SOXHLET'S STERILISER.—The best pattern of steriliser is that of Soxhlet, which can be obtained from most chemists at a moderate price, *e.g.*, complete from the Army and Navy Stores, Calcutta, for 23 Rupees. It contains a tin bottle-stand capable of holding 10 bottles, in which the different feeds for the day are sterilised. The bottles, when ready for sterilisation, are covered with small round discs of rubber, held in place by loose metal caps. The stand containing the bottles is placed in the tin boiling pot, in which are placed a few inches of water, and the lid closed. The pot is placed over a

How used.

fire, and the water boiled for about 45 minutes and then allowed to cool. The milk is sterilised by the steam. The object of the rubber caps is to automatically close the bottles and prevent contamination of the milk after it has been sterilised ; thus, when the bottles cool, the steam inside condenses, producing a relative vacuum, and the disc is depressed by atmospheric pressure. When a meal is required, a bottle is taken from the stand, and warmed by placing it in another small tin containing hot water ; the disc is removed (if limewater is to be used it is added now), and a teat affixed to the neck of the bottle which is then ready for the child. The teats supplied with the apparatus are long, and of soft rubber, and have a cross-shaped opening at the ends ; which does away with the necessity of having a second opening in the bottle to admit air during feeding. Infants not infrequently object to these long teats, as they project too far back into the mouth, and are too soft ; in this case, they may be replaced by the broad-based teats of Allen and Hanbury, which fit the Soxhlet bottles perfectly and are better adapted to the shape of the infant's mouth. If

SOXHLET'S STERILISER.

(*See page* 54.)

these latter are used, the opening must be of the cross-shape as in the case of the soft rubber teats. With the steriliser are supplied the necessary apparatus for cleaning and draining the bottles, spare discs, teats, etc. *The advantages of the Soxhlet's Steriliser are:—The food is sterilised in the bottle in which it is given to the child, and cannot become contaminated afterwards; the bottle itself is sterilised; the day's supply of food is prepared at one time, and is always ready; it is extremely simple and easy to use.*

Advantages.

If the bottle-stand be placed in the boiling-pot, and the latter partly filled with hot water and covered with a piece of blanket or felt at the time the nurse goes to bed, the milk will remain at about the proper temperature throughout the night, and so save much time and trouble when the child awakes for its food. For travelling, it is convenient to have a basket made to fit the steriliser, which can then be carried about with the greatest ease.

If when boiled, or Pasteurised, milk is found to cause constipation, fifteen drops of fluid magnesia added to a few feeds, in place of the limewater or bicarbonate of soda, will remove the trouble; in fact, by ringing the changes between limewater, bicarbonate of soda, and fluid magnesia, the child's bowels can be conveniently regulated.

Constipation.

As to the quantity of milk an infant requires, "It has been estimated that a mother supplies to her baby about half to three-quarters of a pint in the twenty-four hours in the first week or two, and that this gradually increases until, in the latter months of lactation, a daily average of about 2 pints is reached" (Goodhart). A series of experiments conducted in Paris by weighing infants before and after feeding, and other observations, have led to the conclusion that a healthy baby aged 3 months will extract from its

Quantity of milk required by infant.

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mother nearly half a pint of milk at each meal, and allowing five such meals daily, the total quantity will be about 2 or 2½ pints. These facts will serve as a guide to the quantity of food an infant, which is being artificially fed, requires. Meigs and Pepper, who have entered very fully into this subject, allow 10 ounces (ten meals of 1 ounce each) for an infant of 2 or 3 days of age ; thence to the fifteenth day, 15 ounces ; thence to the end of the first month, 1½ pint or more. In the second month, 32 ounces, divided into eight meals. In the third month (seven meals, one every third hour during the day and two meals at night) 35 to 42 ounces. "As the age increases, 8 ounces may be given at a time, five times between 6 A.M. and 10 P.M. and once in the night, making five or six meals, and therefore 40 to 48 ounces per day. This amount of food is scarcely greater than in the second and third months, but by this time it is much stronger."

Variation in quantity.

The length of time which has elapsed since confinement considerably affects the quality of the milk. The water and sugar diminish during the first month ; the solids increase up to the fourth month ; the butter increases up to the sixth month ; the salts at first slightly increase and then decrease. Hence the necessity for the date of the nurse's confinement approximating that of the birth of her nursling.

Milk sugar.

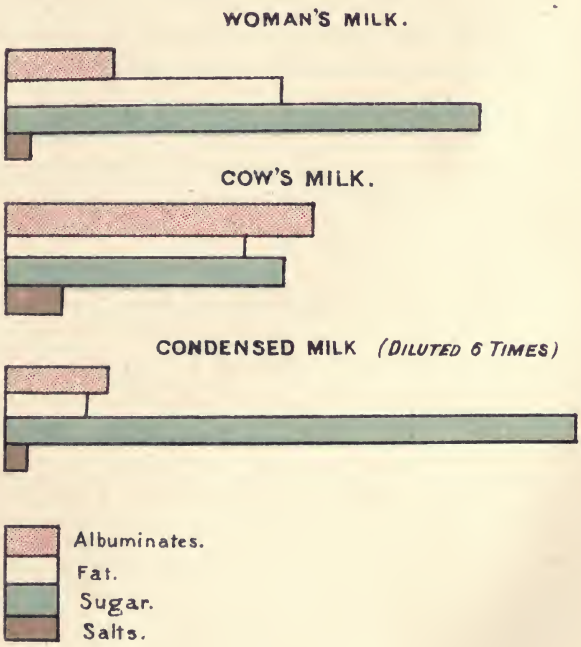
The sugar which milk contains is not the substance which we know by that name. "Sugar of milk" closely resembles grape sugar in quality, and it comports itself similarly in the stomach. Sugar of milk may be procured from the chemist, and should always be preferred to common sugar for addition to infants' food, when it can be obtained.

Condensed milk.

CONDENSED MILK.—There are two kinds of condensed milk—sweetened and unsweetened. Of these

CONSTITUENTS OF MILK.

The comparison is shewn graphically by Holt in this diagram.



the unsweetened is to be preferred. If the unsweetened variety be diluted with three parts of water it very closely resembles cow's milk, and will therefore require to be further diluted exactly as must be done with cow's milk, and in the same degree, to render it a fit infant's food. Thus the curd may be brought to the proper proportion, but the sugar and fat are reduced too much, so that cream and sugar of milk must be added to make it represent human milk. Moreover, the curd will still remain the firmly clotted curd of cow's milk, and will therefore require one of the devices (limewater or barley water added) to modify this defect. The sweetened variety is even more difficult to deal with satisfactorily because of the large addition of cane sugar. The milk must be diluted to bring this to the proper proportion, and then we should add the necessary quantity of cream, estimating ordinary cream to contain about 50 per cent. of fat.

The effect of endeavouring to bring these preparations to resemble human milk is this:—

	Human milk.	Condensed milk (sweetened) diluted 7 times.	Condensed milk (unsweetened) diluted 4 times.
Proteid ...	2 per cent.	1·3 per cent.	2·1 per cent.
Fat ...	3·5 ,,	1·1 ,,	1·9 ,,
Sugar ...	7 ,,	6·7 ,,	2·6 ,,

Patent food.

FARINACEOUS FOODS.—All articles of a farinaceous kind, such as bread, arrowroot, corn-flour, sago, rusks, biscuits, many of the foods for infants, etc., are in every way foreign to the diet of the infant before the period of dentition. "Constituted in great part, as these articles are, of a principal (starch) which has no existence

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in milk, and which requires to undergo a certain kind of digestion to fit it for absorption, it is presumable that the digestive organs are not adapted at this stage properly to meet the demand that is made when these substances are consumed. From the fact that they are light and nourishing for older children there is a popular tendency to regard them as forming suitable food for early infancy, but all authorities concur in condemning them as improper for use at such a period. It is true, later on they represent the most appropriate solid material to begin with, but this is when the digestive organs have reached a more advanced stage of development" (Pavy). "A child is not nourished," observed Dr. Eustace Smith, "in proportion to the bulk of the food he receives into his stomach. He is only nourished by the food he can digest. ...Among the poorer classes children are commonly fed upon farinaceous food as soon as they are born. This, of course, they are totally unable to digest. As a consequence they dwindle and rapidly die, or if of a particularly robust constitution, linger on, weak, ailing, and rickety, until an attack of bowel-complaint or other intercurrent disease carries them off."

Infant digestion unfitted for them.

Dangers of their use.

So immensely important is the appreciation of this matter, that we have preferred thus to quote acknowledged authorities than to give our own words. Farinaceous food is *never* to be substituted for milk, nor should it be presented to the infant in any form or quantity till dentition justifies it. Rest assured that should ignorant anxiety lead to deviation from this simple rule, the mother will, in nine cases out of ten, rue the result. Even after the teeth proclaim the fitness for more than mere milk, too large or too sudden an addition will pretty certainly be attended with illness. Without a sufficiency of milk, and with the

addition of an irritating substance, the child can only live through accident, so to speak,—the chances are it will die. No infant food containing *any* starch should be used by an infant under 7 months of age. It is better and safer to say 9 months.

Infant unable to assimilate them.

An infant's digestive system, in its anatomical details, resembles to some extent that of the flesh-eating animals, especially in the shortness of the length of the intestine, indicating that it is fit to receive only animal food. The saliva is not secreted at all during the first few months, nor has the pancreatic fluid any action upon starch till the end of the third month. A transition is, however, gradually working, and is partially effected when the teeth appear, and these secretions begin to be able to act upon starch, to digest which they are as necessary as is fire to the baking of the loaf. The system becomes each month more and more fitted to utilise farinaceous food, and milk alone becomes less and less adapted for sole and perfect nutriment, though it still must constitute by far the chief proportion.

Farinaceous food, then, before the system is ready for it, is, in the first place, an irritant (and as such indirectly a poison), and, in the second place, it will effectually starve the infant.

Let it not be argued that animal food being anatomically indicated, soups, etc., may with impunity be substituted for milk. Such would be a fallacy, less fatal, perhaps, than unbounded belief in cornflour and arrowroot, yet beyond doubt a dangerous fallacy. For such forms of animal food, as well as for farinaceous substances, Nature, in her own good time, will effectually prepare the way, but she will not brook being tampered with ; she will resent interference in a manner which usually conveys a warning, but which

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renders resistance not only futile, but disastrous. "*It may be laid down that no proprietary food is necessary, for the bringing up of infants by hand, as long as good cow's milk and cream, and sugar, are available*" (Cautley).

INTERMEDIATE FOODS.—There is a class of malted foods which we have still to consider. It will suffice to mention here that this class consists of farinaceous foods which have been so prepared that many of the objections stated in the last section are removed, the work of the salivary and other glands is already accomplished, and the irritating properties are lessened. Dr. Robert Hutchinson divides Infant foods into three groups :—

Classification of the patent foods usually employed.

Group I. Dried milk combined with wholly or partially malted cereals.

Group II. *A.* Entirely malted cereals. They contain no starch, and consist almost wholly of soluble carbo-hydrates, with a little proteid. Example : Mellin's food.

B. Partially malted cereals. All of these foods contain starch in considerable quantities, which is said to be converted into Dextrine and Sugar during the course of preparation for the child's use.

Group III. Cereal foods in which no conversion has taken place. Extracts from Dr. Hutchinson's lecture is attached at the end of this chapter and his table comparing the different foods.

But when are these foods permissible or desirable ?

When permissible or desirable.

Group I is useful in some cases where an infant finds great difficulty in digesting the curd of cow's milk. The curd thrown down from these foods is very fine, and therefore easily managed. They should not be persisted in for more than a few weeks, when attempts to return to natural milk should be made.

Group II class contain no starch, and may be used as an addition to milk, in small quantities—from 3 months of age, and afterwards in increasing quantities. They are nutritive foods, and facilitate the digestion of curd just as barley water does.

Those in Group III are only fit for children of at least 10 months of age. It is better, if possible, to defer them till the twelfth month.

"*Unfortunately, the public usually regard these foods simply as varieties of the 'infant foods' which are everywhere puffed and advertised; but they are nothing of the kind. It is hoped that the remarks and explanations subsequently to be made will lead some to appreciate their real value and to use them with discrimination, by which expression it is intended to convey that they should not ordinarily be used at all without a clear indication, unless the age for the introduction of a farinaceous food has been attained.*"

WATER.—As a very important article of diet, it is essential to understand many things about water.

Pure water not to be denied.

The child, in proportion to its size, requires more water than the adult. It is a cruel and hurtful thing to deny the free use of water to children, as is sometimes done. The error of taking too much is not likely to be committed; but without a sufficiency, the mobility of the fluids (that is, the process of nutrition) is directly impaired, the incoming nutriment is not thoroughly dissolved, nor is the solution of the worn-out tissues (waste) sufficient to enable their removal through the kidneys, skin, lungs, and bowels.

When to be given.

It is quite possible that a child may acquire the habit of drinking water more constantly than is necessary, and it may even be right to check the habit to some extent. But what harm can an abundance do? Very little, if any, while a stinted allowance may do

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much. Fortunately the sensation of thirst is so imperious as to permit but little interference. There are circumstances under which it may be right to withhold water for a short time, but they are very rare. A child should not be allowed to acquire the habit of drinking largely at the commencement of a meal, because the heat which is in the stomach, and which is necessary to digestion, is abstracted. A little later on in the meal, when the stomach has "warmed" to its work, the objection vanishes. In many cases of prolonged and debilitating illness, the drink as well as the food should, for this reason, be given only after having been slightly warmed, although cold food and drink may be more agreeable.

The benefits of water.

The plentiful supply of cold drinking-water is one of the most powerful means of reducing the heat of the body, and it is also essential to supply the great loss by perspiration. "After compensating for the loss by the skin and with the breath, the surplus passes off through the urinary channel, and it is desirable that this surplus should amply suffice to carry off the effect products forming the solid matter of the urine in a thoroughly dissolved state. The notion has been started that it is advisable to restrict the amount of fluid taken with the meals with the view of avoiding the dilution of the gastric juice. Whether as the result of the influence of this notion upon the public mind or not, mischief, I believe, is frequently occasioned, especially amongst the higher ranks of society, by a too limited consumption of fluid. . . . It is a mistake to suppose that when we drink with a meal we are diluting the gastric juice. The act of secretion is excited by the arrival of the meal in the stomach, and the gastric juice is not there at the time of ingestion. It happens, indeed, that the absorption

of fluid takes place with great activity, and the liquid which is drunk during a meal becoming absorbed may be looked upon as proving advantageous by afterwards contributing to yield the gastric juice which is required" (Pavy).

Its impurities and how they should be guarded against.

But water is liable to many impurities, and it is essential that the importance of a really pure supply be understood. A very hard water is apt to cause dyspepsia and perhaps stone in the bladder if continuously used. There is conclusive evidence to show that the most serious consequences have arisen from water polluted with organic matter. This, in fact, is the impurity that is most to be dreaded. Outbreaks of diarrhœa have been very distinctly traced to the use of contaminated water of this kind. It is acknowledged to be one of the most common causes of dysentery, and there is no doubt that typhoid fever is frequently communicated through the medium of water. Again cholera is another disease which may be considered as having been traced to contaminated water, and probably this forms the chief mode of its spread through a community, also several forms of intestinal worms may be propagated through the medium of water.

The ways in which water is liable to contamination in India are numerous. The bheestie's rope and leathern bucket are often kept in a dirty hovel, and when polluted, it may be with distinct disease-germs ; it is lowered into the well ; the sides of tanks are used as convenient places for the offices of nature ; drainage from foul surfaces is permitted to trickle or percolate into wells, washing and bathing take place near wells, etc. Then, again, the bheestie is not too particular whence he obtains his supply, provided it saves him a journey ; the interior of his mussack is frequently contaminated by drawing foul water for horses, etc., and subsequently

Constant watchfulness necessary.

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filling the same mussack with the domestic supply. Nor is the milkman over-careful whence comes the diluent which he deems essential to his profits. Again, in a warm climate, where fermentative changes are so rapid, contaminated water is doubly dangerous, particularly when added to an animal fluid like milk, which fosters germination and the growth of disease-germs.

Tank-water.

Tank-water, being liable to so many sources of contamination, should, as a rule, be avoided. Water taken from a large and quickly-running river is usually better in spite of the impurities it receives, because its motion acts as a purifier. Water obtained from a source closely surrounded by the dwellings of men should be avoided ; surface and marsh water should be rejected as unfit for use.

Filters.

How to purify water of sediment.

Boiling all drinking-water is the best and surest way of securing purity. Filters are not to be relied upon, and often convey a false sense of security. The bheestie should in every household be provided with two buckets, or clean kerosene oil tins for collecting all water for the house. These can be daily scoured and cleansed. In districts it is common for the water during the rains to be cloudy and have a deposit. This can be satisfactorily dealt with if half a teaspoon of powdered alum be added to the water and then stirred with a clean stitch, all the deposit quickly settles, and the clear upper water can then be decanted and boiled without fear.

Alum (Hindustani Phitkari) can be bought in the native bazars for a few annas the pound.

EXTRACTS FROM TWO LECTURES BY ROBERT HUTCHISON, M.D., F.R.C.P., ON PATENT FOODS AND PATENT MEDICINES.

INFANT FOODS.

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LASTLY, we will glance at the group of infant foods. There are many of them, and they are those which, perhaps, in the ordinary run of practice one has more occasion to prescribe than any others that I have mentioned. The number of those infant foods is so vast that it is not to be wondered at that people get confused about their merits. In order to introduce some kind of order into them I divide them into three groups, as shown in Table IV. First Group i.
of all, those which are intended to be complete substitutes for human milk, on which a child may be healthily reared without further addition. In this group there are the Allenbury Foods, Horlick's Malted Milk, Carnrick's Soluble Food, Milo Food, etc. Of these you may say that they are, practically speaking, desiccated milks—milk, that is to say, from which all the water has been driven off, whilst other constituents have been added. I admit that it is possible to feed children healthily on these foods, though they are apt to be deficient in fat; I have reared children on them at Great Ormond Street Hospital for Children. Healthy babies have been reared, for example, on Allenbury Foods. But there is one precaution to take, and that is, when a child gets a little past its first few months one should add to the diet some fresh fruit juice, otherwise scurvy may result. They have also the disadvantage of containing too little fat. But Disadvantages.
the great drawback in regard to these foods is their cost. It is vastly more expensive to rear a child upon Expense.
one of them than upon fresh or even condensed milk.

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Group ii.

Next we have the malted foods and starchy foods in which the starch is supposed to have been altered by the action of a ferment. Infants below six months old are not able to digest starch, and these foods have been introduced to meet that difficulty. They are supposed either to contain no starch, or the starch which they do contain undergoes conversion into dextrine and sugar in course of preparation for the use of the child. The first of these classes is exemplified by Mellin's Food, which contains no starch at all. It may be regarded for practical purposes as simply a desiccated malt extract, and it bears to malt extract very much the same relation that some of the foods of the first group do to condensed milk. *If you are going to use one of that class of foods that is as good a one as you can use, but it is only intended to be an addition to milk.* Now, what of the other class, those, namely, in which the starch is converted during mixing? If you mix them carefully for yourselves you will find that in the majority of them the starch has undergone anything but complete transformation. Now you know the rough haphazard way in which a food is apt to be prepared in the nursery, and I think that those who trust to conversion taking place under these circumstances are very rash indeed. It is better to order a food in which you know conversion has been properly carried out by the manufacturer. Mellin's may be used, but it is extremely poor in fat, and the child's diet is apt to be deficient in that ingredient if such a food enters very largely into it.

Disadvantages.

Group iii.

The last group is composed of those foods which make no pretence to being malted at all; they are starchy foods pure and simple. Perhaps they have been baked so that the starch grains have been ruptured, but otherwise they are floury preparations,

and although many of them are harmless to children who are able to digest starch, and although there may be some use in them in the way of a change, yet they have *no real advantages over ordinary simple preparations, such as baked flour* or oat flour, or any other ordinary cereal preparations. *For children below the age of six months they are to be avoided altogether.* I think that it must have fallen to the experience of everyone here to have seen a great deal of harm done by a misuse of these foods. In the case of adults who are confined to a semi-fluid diet such preparations may occasionally be of service, but an intelligent manipulation of flour, oatmeal, and infusion of malt will make recourse to them very rarely necessary.

Disadvantages.

That exhausts the main groups of foods which I have brought to your notice. I can only say, in conclusion, that I hope that you may now feel in a better position to decide which patent food to order you must order one at all. I hope, also, that to-night you will tell me what your experience of them has been and which of the various kinds you find most useful to you in your ordinary work and most agreeable to your patients.

TABLE IV.—SHOWING THE COM-

Food.	Water.	Proteid.[1]	Fat.	Carbohydrate.	Mineral matter.	
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	
Dried human milk ...	—	12·2	26·4	52·4	2·1	[1.
Group I.						
Allenbury No. 1 (for children under three months)	5·7	9·7	20·0	60·85	3·75	[2.
Allenbury No. 2 (for children of from three to six months).	3·9	9·2	15·0	69·1	3·50	[3.
Horlick's Malted Milk ..	3·7	13·8	9·0	70·8	2·70	[4.
Carnrick's Soluble Food ..	5·3	13·6	2·5	76·2	2·20	[5.
Milo Food	1·56	11·03	3·92	81·38	2·11	[6.
Manhu Infant Food ...	8·8	8·7	5·6	75·9	1·0	[7.
"Maltico"[2]	2·36	16·07	11·80	65·89	3·88	[8.
Group II.—Class A.						
Mellin's Food	6·3	7·9	trace	82·0	3·8	[9.
Cheltine Maltose Food ...	4·6	5·3	0·27	87·6	2·25	[10.
Hovis Babies' Food, No. 1	3·7	7·7	0·20	86·6	1·82	[11.

[1] Calculated from total N by factor 5·7.

[2] *Lancet* analysis May 23, 1902.

POSITION OF INFANT FOODS.

General Description and Remarks.
1.] The standard of composition to which artificial substitutes should conform.
2.] Desiccated cows' milk from which the excess of casein has been removed, and a certain proportion of soluble vegetable albumen, milk, sugar and cream added. No starch present. Half an ounce in three ounces of water for a child aged three months.
3.] Resembles the above, but contains some malted flour in addition. No starch present. One ounce in six ounces of water for a child aged six months.
4.] A mixture of desiccated milk (50 per cent.), wheat flour (26¼ per cent.), barley malt (23 per cent.), and bicarbonate of soda (¾ per cent.), contains no unaltered starch when mixed. Three teaspoonfuls (equals 22 grammes) in four ounces of water for a child aged three months.
5.] A mixture of desiccated milk (37½ per cent.), malted wheat flour (37½ per cent.), and milk sugar (25 per cent.). When prepared according to directions, the casein is partially digested, but a considerable amount of unchanged starch is left. One part to be mixed with nine parts of water and boiled for a few minutes.
6.] A mixture of desiccated Swiss milk, baked wheat flour, and cane sugar (30 per cent.). There is 62 per cent. of soluble and 19 per cent. of insoluble carbohydrates (largely starch) present. To be made with water only.
7.] A mixture of desiccated milk and malted cereals. When prepared according to directions, contains a good deal of unaltered starch. A dessertspoonful (equals 13 grammes) to be mixed with two and a half ounces of water.
8.] Prepared from milk and malted cereals. Free from starch. To be made with water only.
9.] A completely malted food. All the carbohydrate in a soluble form. May be regarded as a desiccated malt extract. Half a tablespoonful (about 5 grammes), a quarter of a pint of milk, and a quarter of a pint of water for a child under three months.
10.] A fully malted food containing no starch. To be made with milk.
11.] A fully malted food. To be made with milk.

TABLE IV.—SHOWING THE COM-

Food.	Water.	Proteid.	Fat.	Carbohydrate.	Mineral matter.	
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	
		Class B.				
Savory and Moore's Food	4·5	10·3	1·4	83·2	0·6	[12.
Benger's Food	8·3	10·2	1·2	79·5	0·8	[13.
Allenbury Malted Food...	6·5	9·2	1·0	82·8	0·5	[14.
Diastased Farina ..	8·3	8·3	1·3	81·0	1·1	[15.
Coomb's Malted Food ...	7·9	12·1	2·8	76·8	0·4	[16.
Moseley's Food	10·8	11·0	0·92	76·4	0·94	[17.
Nutroa Food	6·8	15·9	10·3	66·0	1·0	[18.
Albany	8·6	9·5	2·1	79·4	0·4	[19.
Worth's Perfect Food ...	2·4	11·1	2·0	83·5	0·5	[20.

POSITION OF INFANT FOODS.—*Continued.*

General Description and Remarks.
12.] Composed of wheat flour with the addition of malt. When prepared according to the directions, most, but not all, of the starch is converted into soluble forms (chiefly dextrines). One or two tablespoonfuls (equals one to two ounces) to be mixed with two or three tablespoonfuls of cold milk or milk and water, and one-third of a pint of boiling milk, or milk and water, added.
13.] A mixture of wheat flour and pancreatic extract. When prepared according to the directions, most, but not all, of the starch is converted into soluble forms. The proteid is also partially digested, as well as that of the milk used in mixing it. Take one tablespoonful (about an ounce), and four of cold milk, then add half a pint of boiling milk and water; set aside in a warm place for fifteen minutes, then bring to the boil.
14.] A mixture of wheat flour and malt. When prepared according to the directions, still contains some unaltered starch. Designed for children above six months. One tablespoonful (about an ounce), one teaspoonful of sugar, and three tablespoonfuls of cold water; mix, and add half a pint of boiling milk and water (equal parts).
15.] A malted farinaceous food. When prepared according to the directions, practically all the starch is converted into soluble forms. One ounce of food, half a pint of cold milk, and two ounces of water. Heat slowly till it boils; boil three minutes and sweeten if desired.
16.] A malted, farinaceous food. When prepared according to the directions, still contains much unaltered starch.
17.] Complete conversion of all starch occurs during preparation. To be given with milk.
18.] A mixture of cereals with the addition of a certain proportion of peanut flour, from which the somewhat bitter taste of the food and its high proportion of fat are derived. It is a self-digesting food, but when prepared according to the directions, only part of the starch is converted. One ounce of the food to be mixed with one ounce of cold water, and half a pint of boiling milk and water (equal parts to be added).
19.] A self-digesting, farinaceous food for infants and invalids. To be used with equal parts of milk and water according to directions. Starch not all changed.
20.] A tablespoonful to be mixed with half a pint of cold milk, or milk and water, and boiled five or ten minutes. When prepared according to directions, still contains unaltered starch.

TABLE IV.—SHOWING THE COM-

Food.	Water.	Proteid.	Fat.	Carbohydrate.	Mineral matter.	
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	
Group III.						
Ridge's Food	7·9	9·2	1·0	81·2	0·7	[21.
Neave's Food	6·5	10·5	1·0	80·4	1·6	[22.
Frame Food Diet ...	5·0	13·4	1·2	79·4	1·0	[23.
Bananina	9·5	4·1	0·40	84·0	2·07	[24.
Cheltine Infants' Food ...	7·2	16·2	3·92	71·0	1·83	[25.
Hovis Food No. 2 ...	2·4	5·7	0·10	90·1	1·70	[26.
Opmus Food	10·9	9·1	1·0	78·6	0·4	[27.
Falona	7·0	8·4	3·5	79·9	1·2	[28.
Robinson's Groats ...	10·4	11·3	1·6	75·0	1·7	[29.
Robinson's Patent Barley	10·1	5·1	0·9	82·0	1·9	[30.
Chapman's Entire Wheat Food.	8·4	9·4	2·0	79·3	0·9	[31.
Scott's Oat Flour ...	5·8	9·7	5·0	78·2	1·3	[32.
Nichol's Food of Health	11·9	7·7	1·7	76·9	1·75	[33.
Triticumina Food ...	8·6	12·5	2·2	75·7	1·0	[34.
"I. and I." Food ...	5·5	10·3	2·3	80·5	1·4	[35.
Muffler's Food	4·7	13·8	5·0	74·1	2·4	[36.
Lahmann's Vegetable Milk.	24·4	7·5	24·6	41·8	1·15	[37.

POSITION OF INFANT FOODS.—*Continued.*

General Description and Remarks.

21.] A baked flour, containing only 3 per cent. of soluble carbohydrates, the remainder being starch. Recommended to be made with milk *or* water. Made with water alone is not a sufficient food.

22.] Resembles the above, but recommended to be made with milk and water.

23.] A thoroughly baked flour, to which has been added cane sugar and some extract of bran. It is *not* specially rich in mineral ingredients, but nitrogenous matters are abundant, and it contains much unaltered starch. One-third of an ounce to be mixed with a breakfast cup of milk and water (one of milk and two of water).

24.] A highly starchy food prepared from banana flour.

25.] Contains starch when prepared for use.

26.] Contains about 7½ per cent. of starch. To be made with milk.

27.] A granulated wheat food. One teaspoonful to half a pint of milk. Starch unaltered.

28.] A mixture of cereals (oats, barley and wheat), with a ground fat-containing bean. The food is thoroughly baked, but contains a considerable proportion of unaltered starch. A teaspoonful to half a pint of boiling milk *or* water, or half milk and half water.

29.] Ground oats from which husk has been removed. Rich in proteid and mineral matter.

30.] Ground pearl barley, and of the same nutritive value as the latter.

31.] A finely ground whole-wheat flour. Not much superior in nutritive value to ordinary "households" flour. Starch mostly unaltered. To be used with milk.

32.] A fine oat flour. Starch unaltered.

33.] To be used with equal quantities of boiling milk and water for making infant gruel.

34.] To be made with equal parts of milk and water, with the addition of sugar.

35.] An infants' and invalids' food. To be made with water only, or half and half water and milk, and sweetened to taste.

36.] Prepared from milk, wheat flour, and eggs; sterilized *in vacuo*. To be used with water or milk.

37.] A preparation derived from nuts, and intended to be added to diluted cows' milk, in which it raises the percentage of fat and lessens the density of the curd.

CHAPTER VII.

DENTITION AND ITS MANAGEMENT.

GROWTH.

The order of appearance of first set.

THERE are two periods of teething, the first in infancy, the second in childhood. The germs of the first (milk or temporary) set have existed within the jaw for several months before birth, but they are at no time covered with true bone. As ossification advances, the tooth rises, and pressing upwards, causes absorption of its capsule and the gum, till by their removal the tooth makes its appearance. This upward progress, in its later stages, is what we mean when we talk of "teething." The temporary teeth usually appear in the following order :—

1. The two middle cutting teeth of the lower jaw, at about the seventh or eighth month.

2. The corresponding teeth of the upper jaw, at about seven and a half or eight months.

3. The two lower lateral cutting teeth, at about the ninth month.

4. The corresponding teeth of the upper jaw, at the tenth month.

5. The two front grinders of the lower jaw, from twelve to thirteen months.

6. The corresponding teeth of the upper jaw, at about fourteen months.

7. The four eye-teeth in the vacant spaces, between the sixteenth and twentieth months.

8. The second grinders, between the twentieth and thirtieth months.

The appearance of second set.

With the appearance of these twenty teeth the first dentition is completed. Strange as it may appear, the germs of the second set also existed in the jaw before birth, more deeply seated than those of the milk teeth. At about the sixth or seventh year a grinder appears behind each of those already existing, making a total of 24 teeth, and soon after their appearance the central front teeth fall out, their roots having been absorbed by the advance of the young permanent set. About a year is occupied in shedding the four central cutting teeth (fig. 2), and another year by the four outer cutting teeth (fig. 4). During a third year the front grinders (fig. 6) are similarly replaced. Next, the second temporary grinders, and lastly, the eye-teeth are shed at any time from 9½ to 12½ years, while a little later, four new grinders show themselves, making 28 teeth. Between 17 and 21 years, the last

four grinders, or the "wisdom teeth," complete the full set of 32.

The order above related is not invariably followed. On the contrary, deviations are numerous. Children have, rarely it is true, been born with teeth, and children have reached the age of 1½ year without a tooth showing, but the above description is the general rule. Very frequently the side cutters of the upper appear before those of the lower jaw, and often the temporary eye-teeth fall out before any of the grinders.

Indication of delay.

As a rule, a healthy child teeths with a close approach to regularity. Delay in the appearance of the teeth usually argues want of development, consequent upon some constitutional fault.

In England it is an observed fact that the first dentition is passed through with less trouble during the summer than the winter, in the country than in large towns, and, as might be anticipated, by healthy than by delicate children.

Most of those who are best entitled to give an opinion as regards India, hold that teething is a process which, *per se*, proceeds with moderation, and such I am persuaded is the case. Sir R. Martin observes, "It may be said that under ordinary care in diet and clothing the operation of teething proceeds kindly in the climate of India; and speaking from my personal experience I should say that severe teething irritation is seldom a primary affection, but that, on the contrary, it generally follows upon previously existing gastric, intestinal, or febrile disorder; and it is not too much to say that in 18 cases out of 20 these last are but the result of mismanagement and weakness, more common to the most civilised than to the most barbarous communities;" and he adds, with as much force as truth, "to read some books and to hear some people talk, one might be

Teething mild in India.

led to suppose that the teething process of infancy is a *morbid* one from beginning to end." Every affection, whether it be a trivial skin eruption, or a fatal diarrhœa, is usually attributed to teething, should such complications happen to occur during its progress. An unfortunate infant who is poisoned with some variety of cornflour, dies of diarrhœa ; or, during the course of this affection, a convulsion ends the brief life, whereupon, death is without hesitation attributed to teething. Another, carelessly exposed to malarial influences, is attacked with fever, and similarly perishes in a convulsive fit,—again teething is blamed ; while down the throat of a third are thrust lumps of meat and highly seasoned curries, and the usual bloody bowel evacuations which of course succeed, are, the parent thinks, due to teething.

Popular fallacies.

It is not for a moment intended to be affirmed that teething has no influence on the constitution. It has this influence, that the nervous system, already possessing high susceptibility, is then still further exalted in its sensibility, but it is not true that nature has subverted one of the natural processes of growth into a mode for slaying an indefinite number of infants. No doubt through carelessness and bad management, the mortality is higher during teething than if there were no such process in nature ; possibly, even with all due care, a few of the more delicate might be cut off in consequence of the additional state of nervous tension, but teething never did kill anything like the number of infants whose deaths are attributed to it.

The real effect.

Here we would enter an earnest protest against the popular idea that diarrhœa during dentition is a natural and a good thing. So far as India is concerned, it cannot be too clearly understood that diarrhœa is

Diarrhœa always a bad sign.

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never a good thing, that under any circumstances there is always a very considerable element of danger in it, and that the convulsions which it is supposed to ward off during teething are a common mode of death from purging without any dentition at all. Many an infant has been sacrificed to this prejudice by anxious mothers, who would willingly lay down their lives for their children's sake. The purging, it is argued, is not to be checked because the child is teething. The infant becomes weaker and weaker, more flabby and more pallid. At last a doctor is consulted, who, seeing through the case, endeavours to check the progress of the drain (an effort in which he may be thwarted if an ignorant nurse or parent has any voice in the matter), but possibly too late,—a convulsion may end life, and, according to the popular theory, the purging having been checked or attempted to be checked, "it went to the head." What "it" represents is as difficult to conceive as to explain.

General management.

The dribbling and crossness of the child, the swollen state of its gums, and its desire to bite at things—when these signs exist, which is by no means always the case—show that the coming of the teeth is felt by it. When such is the case, we should naturally be particularly careful as to simplicity of food, avoidance of exposure to chills or sun, and of over-heated verandahs. We should keep the bowels regular, seek the open air, not permit diarrhœa or constipation, be careful to have the clothing adapted to the season, and be very particular that sleep, which the warm bath will facilitate, be obtained in abundance; and very occasionally the gums may be lanced, especially if there be muscular irritability and irregularity of action, when a few doses of bromide of potassium (9) should also be given, and any feverishness met by seclusion,

absence of excitement, a gentle aperient, and a fever mixture (38).

As to lancing the gums, there is a singular prejudice against it on the part of some. We think it is essential and very useful when there is feverishness and a swollen state of the gum, but that otherwise it is unnecessary. It is, however, as nearly painless as can be, and no harm can result from it, unless there be ignorant and cruel hacking, which will increase the irritation fourfold. It is a mistake to imagine that a gum which has been once lanced, and which has closed over a tooth, is more resisting than formerly. On the contrary, although the gum may appear to have healed, the probabilities are it never has actually united, but only approximately closed; at all events, it is less capable of causing obstruction.

Carious teeth.

As the child grows older he may suffer from toothache consequent upon decay. It should be recollected that it is a serious thing to extract teeth from a jaw that is rapidly developing, because the jaw is then apt to contract, not allowing room for the coming teeth, which will be huddled together irregularly. Moreover, toothache often causes a child to bolt his food and thus disorder health. Dentists now stop teeth, even of the temporary set, very early in life.

Diet.

Diet after the appearance of the First Teeth.— Although a definite period is mentioned as that at which the first change of diet may with advantage be made, or rather when another form of alimentation may be cautiously given in addition to the mother's milk, it must be laid down as a law, that this alteration is to depend not so much upon the age, as upon the readiness of the system as indicated by the teeth. *Till the first pair of teeth have come fairly through, the mother's (or nurse's) milk alone is to constitute the sole food, when*

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there is a sufficiency of it. Even then an alteration is to be very gradually and watchfully made ; and it is at first to consist simply of two meals a day, of cow's milk, which may be given now pure or very slightly diluted to limewater and sugar.

The objects of the addition of the limewater are (*a*) to correct the natural acidity of cow's milk and to make it resemble that of the woman in this respect, and (*b*) to facilitate digestion by preventing very solid curdling. All milk which enters the stomach is converted into curd, but when limewater is added the heaviness of the curd is said to be lessened. When infants are over-fed or when they drink too quickly, they often reject a portion of milk, which being curdled, one might imagine was not agreeing, but the curdled condition is a natural one.

To lessen curd.

Another very useful way of rendering cow's milk readily digestible by lessening the quantity of curd in the milk, is to add—one grain of sodium citrate to each ounce of the milk, given per feed.

If necessary, a third similar meal may be given in the 24 hours. Even at this period the power of utilising any other substance than milk, as has been shown in a previous section, has been but partially acquired ; therefore it is well to wait till another month, *i.e.*, the seventh, has elapsed before any farinaceous articles are added to the diet. Then the addition ought invariably to consist of an article selected from the intermediate class of foods for the reasons stated in the chapter on artificial feeding. Either Savory and Moore or Mellin's preparation will answer.

Let it be a standing rule that the first addition to the simple milk diet of infancy be one of this valuable class, which should always be adopted as the introductory medium to the true farinaceous foods. Of course, a mother may be compelled, long before this

Farinaceous foods.

period, to supplement the ordinary food of nature, and for such a case instructions will be found under the heading "Artificial Feeding;" but just now we are considering the case of a healthy child with a healthy mother or nurse, who is fully capable of performing her part.

After a short time, say at the ninth month, there may be no objection to employing ordinary farinaceous articles of food, such as Robb's biscuits, Hard's food, or baked flour. But whatever selection be made, the milk should be but *slightly* thickened with it.

Nurses are always desirous of making the food as thick as possible, with the object of rendering it more "satisfying." True, a thick food may apparently have such an effect, but it is really torpor and not satisfaction which is induced, while the practice jeopardises the healthy working of the bowels. It is difficult to persuade an untrained nurse that because good hearty feeding of the kind will fatten an older child, it will not have the same effect upon the tender infant, but that it will be actually bad for it.

Weaning should be commenced at the end of the ninth month.

Weaning and diet.

About the time of weaning, a little *weak* broth may be given once a day, but at an earlier period it would be very apt to cause acidity and flatulence. The broth may, with great propriety, be added to the milk. On no account should meat except raw meat juice, pass a child's lips before it has reached 1½ year of age, and it is very seldom desirable before the age of two. Certainly two years of age is sufficiently early to commence meat in ordinary circumstances. The Indian dish "pish-pash" is in every way suitable.

Should there be much annoyance from the teeth at any time, such periods should be avoided for changing or adding to the diet.

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It is a common practice to give children at about this age a bone to suck, and other similar dainties. This practice is a bad one ; firstly, because the limit is not likely to be made at the mere bone—a little flesh is sure to be allowed to adhere—and this leads to other dangerous departures from good management ; and secondly, because the taste is perverted, the simple milk is rejected, and stronger meat petulantly demanded. The practice of giving a young child a taste of everything it may fancy is, says Churchill, "a monstrous invasion of nature, which will inevitably entail its own punishment in delicacy, ill-health, and suffering."

For further information on these topics the reader is referred to Chapter IX. Here they are only alluded to incidentally in relation to dentition.

Healthy growth.

It may be of interest here to say something about the growth of a healthy child. When born, the average weight is 7lbs., and the length 19 or 19½ inches. At five months the weight is doubled, and at a year is trebled. The following is a table of heights and weights for ages :—

Age.	Height.	Weight.
At birth ...	19½ inches ...	7lbs. 8 ozs.
„ 1 month ...	20½ „ ...	8 „ 5½ „
„ 2 months ...	21 „ ...	10 „ 4 „
„ 3 „ ...	22 „ ...	11 „ 5 „
„ 4 „ ...	23 „ ...	13 „ 9¼ „
„ 5 „ ...	23½ „ ...	14 „ 14½ „
„ 6 „ ...	24 „ ...	16 „ 3½ „
„ 7 „ ...	24½ „ ...	17 „ 5 „
„ 8 „ ...	25 „ ...	18 „ 10 „
„ 9 „ ...	25½ „ ...	20 „ 1 oz.
„ 10 „ ...	26 „ ...	20 „ 5½ ozs.
„ 11 „ ...	26½ „ ...	21 „ 2 „
„ 12 „ ...	27 „ ...	22 „ 7 „

"During the second year the increase in height is from three to five inches; in the third, from two to three and a half inches; in the fourth, from two to three inches." (Dr. Louis Starr).

Dr. Angel Money's investigations led him to the conclusions that "a child in health generally gains twenty pounds in weight and ten inches in height in the first two years of life; in the third year four pounds and four inches are about the usual additions to weight and stature. During the next six years the body increases by annual increments of four pounds in weight and two or three inches in height. After ten years the body puts on flesh at the rate of eight pounds a year."

Average Heights and Weights.

Dr. G. W. Stephenson has recorded the average heights and weights of the English-speaking races as follows :—

Age.	Boys.		Girls.	
	Height (inches.)	Weight (pounds.)	Height (inches.)	Weight (pounds.)
5 years ..	41·30	40·49	41·05	39·63
6 ,, ...	43·88	44·79	42·99	42·84
7 ,, ...	45·86	49·39	44·98	47·08
8 ,, ...	47·41	54·41	47·09	52·12
9 ,, .	49·69	59·82	49·05	56·28
10 ,, ...	51·76	66·40	51·19	62·17
11 ,, ...	53·47	71·09	53·26	68·47
12 ,, ...	55·05	76·81	55·77	77·35
13 ,, ...	57·06	83·72	57·96	87·82
14 ,, ...	59·60	93·46	59·87	97·56
15 ,, ...	62·27	104·90	61·01	105·44
16 ,, ...	64·66	120·00	61·67	112·36
17 ,, ...	66·20	129·19	62·22	115·21
18 ,, ...	66·81	134·97	62·19	116·43

Budin (*Rev. Gen. des Sciences*, No. 21) insists upon the value of constantly weighing infants as the best

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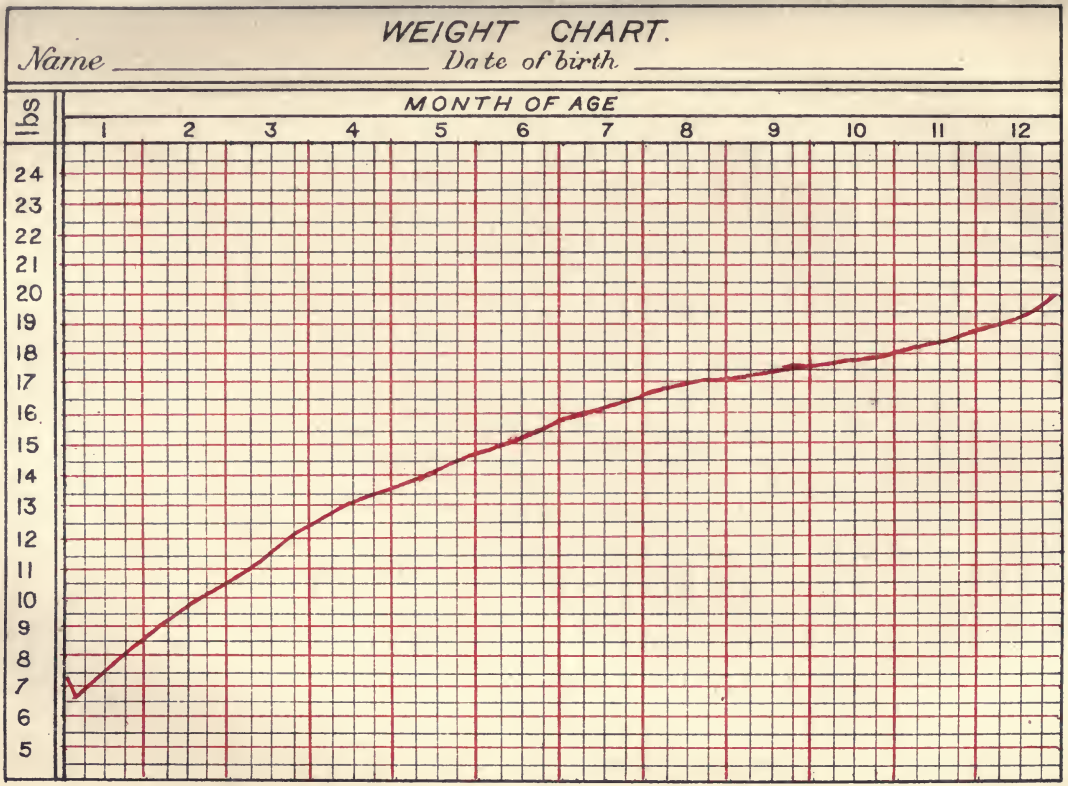
means of testing the condition of nutrition and the relative value of the different modes of feeding. There is always a little loss of weight for the first few days. This is natural, consequent upon the delay in the secretion of the milk. Contrasting the increase of weight in infants (1) suckled, (2) only partly suckled, and (3) artificially fed, during the first ten or twelve days of life, the average gain was approximately twice as great in the first class (432 grains) as in the third (218 grains), while with the mixed diet the rate was intermediate (278 grains). The quantity of milk should be so adjusted as to lead to such a steady increase as will double the weight in five months, and treble it in the first year. There should be a gain of four ounces weekly during the first six months ; later the gain is not so much. *Failure in the mother's milk will be shown by arrest in the increment of weight*, but it should be pointed out that loss of weight accompanied by vomiting may possibly be a mere indication that the quantity of milk is too large.

It is very important that weekly weighments should be made, and recorded upon a chart such as is here shown.



The weight-curve of the first-year (Holt)

CHAPTER VIII.

WEANING, LACTATION, SUCKLING.

SECTION I.—WEANING. SECTION II.—TOO PROLONGED LACTATION. SECTION III.—THE RESULTS OF SUCKLING COMPARED WITH OTHER METHODS OF REARING.

SECTION I.—WEANING.—The factors determining the period when a child should be weaned, namely, the fitness of the nurse to continue her office, the general health of the child, and the development of its teeth, should be carefully weighed before a decision is arrived at. Obviously we should incline to delay the cessation of the natural food of the infant if its dentition be backward, for the teeth still continue to indicate faithfully the forwardness of development. Similarly, if a nurse be fairly good, we should not counsel a discontinuance of nature's food in the case of a sickly child, although it may be deemed judicious to supplement this with some other kind of nutriment.

Weaning when and how it should be begun.

Broadly speaking, we may fix from the ninth to the twelfth month as the period for weaning with safety; never before the one, if it can be avoided, nor after the other. The milk of the strongest woman becomes poor after 12 months' nursing; and her health, if the attempt be further prolonged, is pretty sure to be injured. Many native women make excellent nurses for a full year, but it is seldom so with the European mother in India.

We should, as before said, avoid weaning at a time when there is much teething irritation, selecting rather period of quiescence of the nervous and digestive

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systems. The process of weaning should be a gradual one. The mother should at first abstain from nursing at night, and after a time she need only suckle her infant twice a day, morning and evening. The demand for the milk being thus lessened, the supply will decrease steadily in proportion. Should the child, with persistent perversity, decline to accept other food than that of the breast, it must be permitted to suffer hunger, a weapon which, if judiciously employed, will eventually conquer. As to feeding after weaning, the subject will be treated under "Artificial Feeding."

SECTION II.—TOO PROLONGED LACTATION.—Although nursing is a natural function under which the health usually improves, if continued too long, the constitution will suffer. Nervous symptoms will supervene, the appetite become impaired, and the digestive organs fail. Mental depression, headache, and loss of flesh are the more marked signs, while singing in the ears, faintings or faintness, palpitation and pains in the breast, are each of them warnings which should not be neglected.

Derogatory symptoms.

Effects on child.

There are also effects upon the child with which it is important to be acquainted. Children subjected to this mismanagement for any length of time become pale flabby beings, whose stamina cannot be easily re-established by subsequent good management; their stomachs enlarge; their appearance is pinched, they continually whine, and occasionally scream shrilly. Such children are unusually liable to rickets and wasting diseases.

SECTION III.—THE RESULTS OF SUCKLING COMPARED WITH THOSE OF OTHER METHODS OF REARING.—"The infant," says Dr. West, "whose mother refuses to perform towards it a mother's part, or who, by

accident, disease, or death, is deprived of the food that nature designed for it, too often languishes and dies. Such children you may see with no fat to give plumpness to their limbs; no red particles in their blood to impart a healthy hue to their skin; their face wearing in infancy the lineaments of age; their voice a constant wail; their whole aspect an embodiment of woe. But give to such children the food nature destined for them, and if the remedy do not come too late to save them, the mournful cry will cease, the face will assume a look of content, by degrees the features of infancy will disclose themselves, the limbs will grow round, the skin pure red and white; and when at length we hear the merry laugh of babyhood, it seems almost as if the little sufferer of some weeks before must have been a changeling, and this the real child brought back from fairyland." But there are not wanting many who, because they have known instances where children have been successfully reared by hand, will not hesitate to urge a similar course upon their acquaintances. Let us, therefore, turn from a general statement to hard facts. Dr. Routh has compiled the following table, which speaks for itself:—

The results of natural and artificial feeding compared.

Method of feeding.	Result in each 100 cases.
1. Breast milk alone till ninth month or longer	63 well developed. 23 medium ,, 14 badly ,,
2. Breast milk somewhat scanty, necessitating other food during later months to supplement breast milk	57½ well developed. 25½ medium ,, 16 badly ,,
3. Small supply of breast milk only, necessitating additional food from birth.	27 well developed. 26 medium ,, 46 badly ,,
4. Fed entirely by hand from birth—no breast milk at all.	16 well developed. 26 medium ,, 64 badly ,,

(See also "Growth.")

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Compare the fourth with the first series, and it will be seen that the numbers have become pretty nearly inverted ; that is, out of each 100 hand-fed children, 10 only have shown good development (and how many never live to undergo the test ?) against 63 naturally nursed children !

The process by which children brought up by hand, and who are improperly fed, decline into the grave, is usually gradual. If so fed from birth, the child "seldom lives longer than 2 or 3 months. If he has been suckled for some months before the commencement of the improper food, he has greater power of resistance ; and although under the new diet he will soon become dull, and pale, and flabby, yet the effect upon his flesh and strength are less noticeable, and he usually drifts into rickets before any appearances have been thought sufficiently serious to require medical interference." (Eustace Smith.)

Rickets is a comparatively rare disease in a tropical climate. It is due to mal-nutrition and the deprivation of fresh air and light. It is most frequently met with at about 18 months or 2 years of age, and is characterised by restlessness at night, sweating of the head and neck, diarrhœa, delayed dentition, great pain when the child is lifted, and flabbiness of the muscles, while at the same time there is an unhealthy pale plumpness ; afterwards softening of the bones and certain deformities of the head and limbs take place. Obedience to the laws of hygiene and dietary already inculcated will prevent its occurrence, while *too prolonged lactation or an exclusive use of condensed milk or infant foods will produce it.*

Rickets rare.

It is needless to trouble the reader further with figures, but it may be stated that the mortality of hand-fed children is vastly in excess of that of those who are nursed at the breast. Dr. Merriman, after much careful

Mortality very great in hand-fed infants.

investigation, goes so far as to state that the attempt at hand-feeding in London "proves fatal to seven out of eight of these miserable sufferers." The records of Foundling Hospitals bear similar testimony.

Nothing, therefore, but the most urgent necessity justifies a mother in bringing up her child by hand. Even partial hand-feeding should not be lightly undertaken, though it is admitted that this course is quite justifiable if the mother is unable to supply all the nourishment needed. Being partially able to nurse without detriment to her own health, it is her manifest duty to do so, and to supplement her own nourishment thoughtfully and carefully. Statistics show that such partial nursing very considerably decreases the risk to the child.

Only urgent necessity justifies it.

It is but right to mention here that the figures in the foregoing table and the other statistics regarding artificial feeding are open to the very just objection that they include those who have been *fed artificially upon bad as well as upon sound principles, or upon no principle at all; and that any argument deduced from them cannot apply to cases where proper food is given, combined with good general management;* still the numbers show what the public actually do accomplish in attempts which are doubtless mainly actuated by the best motives.

CHAPTER IX.

ARTIFICIAL FEEDING

THE METHOD OF ARTIFICIAL FEEDING, AND SOME HINTS REGARDING THE DIET OF CHILDHOOD.

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WHEN a mother is unable to suckle her child a wet-nurse should be obtained whenever possible. If it is impossible to obtain a wet-nurse, the child must be brought up by hand. The deficiency of the mother, however, seldom amounts to absolute inability, and it is her duty to nurse her infant to the full extent of her capacity, however partially she may be able to fulfil the task. In almost the worst cases she will be able to suckle twice a day, for a few weeks at all events, and for the rest, artificial feeding must be relied upon. Alternate suckling and artificial feeding are better than weaning.

Occasional suckling.

But hand-feeding is a process which demands so much attention on the part of the nurse, and so much judgment in adapting the nature of the food to the powers and requirements of the infant, that the general result is eminently unsatisfactory, and it is therefore a course which should be entered upon with reluctance. On the other hand, it is quite certain that infants may be satisfactorily reared artificially, provided all the teachings of experience and science be adhered to.

Difficulties may be overcome.

An infant, then, is to be brought up by hand :—Let it be again and again impressed upon the parents that milk, and nothing but milk, under these or any other circumstances, is the only article in the world which is a true food from the moment of birth till the first teeth have appeared. On a previous page it has been shown that by proper dilution and the addition of sugar

Cow's milk.

of milk, cow's milk may be made to resemble pretty closely that of the woman, especially if some cream (which is always easily digested by infants) be added. But mere dilution will not suffice to effect the necessary similarity, because cow's milk curdles into a firm, heavy clot when it enters the stomach, while woman's milk behaves quite differently, falling down in separate loose particles. There are two simple means by which it is sought to obviate this objection to cow's milk. The first is by the addition of limewater, which, however, is so weak (containing only ½ grain of lime to each ounce) that a large quantity of this solution is required, unless the saccharated solution of lime (*see* Receipt No. 2) be substituted. The second means is by the addition of a small quantity of barley water (*see* Receipt No. 3)—not, be it remembered, with the object of increasing the nutritive properties of the food, but of preventing the disposition to too firm clotting by so separating the particles of curd that they do not come together into so heavy a lump. It is as well to know that no other farinaceous article than barley will well meet the requirement, because it alone contains very little starch, and that little is in a state of extremely fine division.

Its dilution to prevent curdling.

Of these plans, dilution with barley water is to be preferred. The addition of a little well-diluted Mellin's food will effect the same object. But the addition of some limewater is also desirable in order to overcome the natural acidity of cow's milk, and for this purpose two tablespoonfuls added to a pint of milk suffices. On the whole, it is better to restrict the use of limewater to this object unless circumstances require otherwise.

Barley water the best diluent.

For the newly-born infant one tablespoonful of milk may be diluted with three of warm filtered water, and to this should be added a teaspoonful of lime-

For the newly-born.

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water, or it may be treated with barley water instead, as above described ; a sufficiency of sugar of milk (a small level teaspoonful to each bottle), or white sugar to slightly sweeten the food, completes the preparation. Brown sugar should not be used, because it is apt to set up fermentation and cause acidity.

In a previous chapter, we have spoken of the reasons for weaning and have laid stress on the fact that the *most important reason for artificial feeding is, persistent loss of weight while the child is at the breast.* We have now, then, to consider how much of the diluted milk we shall give and how often ; and also, in what ways it may be necessary to vary the feeding in order to suit the requirements of a child in a difficult case.

Home modification of cow's or goat's milk.

In every case it is usual to start artificial feeding with cow's milk. Sometimes, however, this may be unobtainable. Under such conditions goat's milk should be used. What then must the dilution be and how is the diluted mixture to be made as nearly as possible alike to that of human milk. These are the questions that the parent must deal with, and with the object of making the matter quite clear, the following table has been drawn up :—

Home modification of cow's milk.

Age.	Dilution.	Number of feeds in 24 hours.	Quantity per feed.	Quantity of diluted milk in 24 hours.	Quantity of sugar of milk to be added.	Quantity of cream to be added.
2—7 days	1 in 3	10	1 ozs.	10 ozs.	½ teaspoon	½ teaspoon
1 month	1 in 2	10	2 ozs.	20 ozs.	½ teaspoon	½ teaspoon
2 months	1 in 1½	9	3 ozs.	27 ozs.	1 teaspoon	½ teaspoon
3 ,,	1 in 1	8	4 ozs.	32 ozs.	1½ teaspoon	½ teaspoon
4 to 5 ,,	1 in ½	7	5 ozs.	35 ozs.	1½ teaspoon	1 teaspoon
6 to 7 ,,	1 in ¼	6	7 ozs.	42 ozs.	1½ teaspoon	1 teaspoon
8 to 9 ,,	Pure	6	7 ozs.	42 ozs.	1 teaspoon	1 teaspoon

Unfortunately in India cream is not always readily obtainable, and the milk being not over-rich makes the absence of it all the more felt, for of course, cream supplies the deficiencies of fat in the milk. This difficulty can usually be met by standing a quart of milk in a long glass flask for 3 hours, in an ice chest or cold place, when it will be found that the upper quarter of the flask will contain the cream which rises to the top. When obtaining cream in this manner it is best to use a graduated bottle with a tap near the bottom by which the lower $\frac{3}{4}$ of milk can be withdrawn.

How to obtain cream.

Sometimes the procuring of cream is impossible or unreliable, then it is best to add 10 to 20 drops of Cod Liver Oil to the feeds, three times a day or add 5 drops to each feed if the child is constipated and you think is not getting sufficient fat in its food. At other times great benefit is obtained by adding 5 drops of the yolk of an egg to each feed.

Substitutes for cream.

Occasionally it is the curd alone that gives trouble, then the addition of one grain of sodium citrate to each ounce of the milk will often completely rectify the trouble by making the curd finer and less indigestible. The addition of sodium citrate is then a method not to be overlooked if the curd is at fault in the stools or stomach.

Curd.

Supposing the above methods have been thoroughly tried and the child does not gain in weight, and the milk does not seem to agree, what next is to be done? We advise condensed milk as a temporary measure which is of very great value if suitable precautions be taken after diluting it to rectify the deficiency of fat, and this can be done as mentioned above.

Condensed milk.

The best brand to use is undoubtedly the unsweetened Nestle's milk, but this is difficult to obtain, so we

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recommend the sweetened brand, and this should be used in the dilution of 1 part to 15 or 20 of water to which 1 teaspoon of cream should be added to every 3 ounces of the mixture. Condensed milk so rectified may tide a child over the period of a month or 6 weeks with great benefit ; but it is well to remember that there are dangers of scurvy and rickets if it be used much longer, and that a little orange juice given daily and the addition of Mellin's food to the mixture is very desirable ; after which the cow's milk diet with, if necessary, Mellin's food added to it should be again tried. We would advise not more than one teaspoonful of Mellin's food three times a day in the mixture to start with.

Dried milk preparations.

Cow's milk and condensed milk have been given good trial and yet the child does not flourish. What next can be done ? We advise one of the dried milk preparations being tried next among the best of which undoubtedly are Horlick's Malted Milk and Allenbury's No. 1 if the child is under 3 months of age and No. 2 if above this limit. Another very excellent preparation is a dried milk called Glaxo which sometimes better suits than either of the above. (But as to the use of these foods see remarks below.) If after the above have been given fair trial there are still difficulties—the child is not gaining in weight, there is colic and flatulence, and perhaps passage by mouth or rectum of undigested curd, we would recommend that a trial be given to Peptonisation as a temporary measure. But it must be for but a short period as there is danger of upsetting the gastric digestion if peptonised milk be given for long. An excellent preparation is Fairchild's Peptogenic Milk Powders which are supplied with full directions as to use, and it is advisable to add a proportion of cream or one of the substitutes above

Peptonising.

mentioned in order to accurately adjust the correct proportions. It is also wise to bear in mind that peptonised milk is a mild laxative and may even set up a mild diarrhœa to start with. If peptonising does not avail or is impossible, refuge can still be taken *temporarily* by using whey or albumen water. But in using whey prepared either by adding rennet or sherry, it is very important to realise that whey by itself is insufficient nourishment, for that it practically contains no fat. Hence it is necessary to add 1 part of cream to every 8 or 10 of whey or one may add Cod Liver Oil or the yolk of the egg 5 to 10 drops to each feed. Sometimes whey mixed with Mellin's food is a useful *temporary* stand-by, until the child is again able to get back to cow's milk and its digestive capacity has rallied.

Or whey as a temporary measure.

The above are the lines on which the child should be artificially fed during the early months of its life when weaning has become a necessity, and it will be under very exceptional conditions, if these directions are intelligently followed out, that the mother will be unable to tide over an infant of the feeblest digestive capacity until such time as it has cut some teeth and improvement in its health becomes apparent.

And here we would strongly affirm *that in artificial feeding no change should be made lightly from one food to another until fair trial has been given.*

Under ordinary circumstances, the gain in weight in a *fortnight* is sufficient information to justify the continuance of the line of feeding or no. For in the words of Hutchison, "It is impossible to judge from one week's experience what any particular food is going to do for the child."

Finally, we come to the consideration of the use of goat's milk, and in certain cases, where all else above

mentioned has failed, the uses of the proprietary foods alone.

Goat's milk.

Goat's milk is readily obtainable in India and is rich in proteid and fat, and when cow's milk is not easily procurable or its sources doubtful and the child has good digestive powers, there is no doubt that many an infant thrives excellently on it, for the curd is more finely divided and hence less liable to upset the digestion than that of cow's milk. A goat is somewhat of a promiscuous feeder, so it is advisable that if its milk is to be used that the animal should be tied up and fed regularly and efficiently and be milked with due care to cleanliness. Goat's milk should be diluted the same as cow's milk and will be found to have no appreciable difference in flavour. *Where cow's milk is doubtful, we strongly recommend the use of goat's milk before all other methods of artificial feeding are tried.*

Proprietary foods.

In certain exceptional cases after all the above methods have been tried intelligently, it may be necessary to fall back on one of the proprietary foods. However, we would reiterate that, despite all the advertisements to the contrary, there is not a single patent food on the market which can adequately replace either human or cow's milk for any prolonged period. However, there are among these foods certain which are useful as *temporary* substitutes either alone or combined with cow's milk or whey. But it must always be borne in mind that every one of these foods is deficient in fat, which must be rectified as already mentioned, if one would obviate the danger of rickets. Moreover, a large number of cases of scurvy have arisen from the use of these foods ; so orange or other fruit juice must be given daily in small quantities as well.

Their disadvantages.

Among the best of these proprietary foods are Mellin's, Horlick's, Allenbury's foods and Glaxo.

Child nine months old and onwards.

At about the age of *nine months* a little *thin* chicken or mutton broth, or veal tea, carefully freed from all grease, may be given in lieu of one of the meals of milk, or the broth may, with great propriety, be mixed with the milk.

At ten months, the quantity of farinaceous food may be increased, and, if necessary, the yolk of one egg may be beaten up with the afternoon milk meal. On no account should any article be allowed to supplant milk as the staple diet. At this age the child will consume about two pints of milk in the twenty-four hours. The child is now quite sufficiently old to be capable of appreciating a variety in its food, and it will thrive all the better for it. To meet this end, instead of the egg and milk meal, broth or beef tea (receipt No. 5), and a rusk, may be allowed every alternate day ; or half a teaspoonful of cocoatina (not cocoa, which is too rich) may be added to the morning meal instead of the farinaceous meal. To avoid the evil of having to give food between meals, care should be taken that a sufficiency is offered each time to satisfy all reasonable demands.

From 1 year old variation in diet.

After twelve months of age, light puddings, well-mashed potatoes with gravy, or the lightly boiled yolk of one egg may be allowed ; and with meals which were before purely of milk, a rusk or a slice of stale bread soaked in milk may be given. The fifth, or night meal, may now be discontinued. A child should always have a drink of milk if it wakes in the morning long before its breakfast hour, or if it is sent out of doors before breakfasting, as is usually necessary in the hot weather. Milk still is to be the staple food.

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From this age as the child's teeth are rapidly developing, it will be found of great benefit to allow it to gnaw or bite every day a few fingers of hard baked toast soaked in dripping fat.

At eighteen months of age, a very little meat may be allowed,—a small piece of roast mutton, without fat or grease, finely minced or pounded, is as suitable as any; or the Indian dish, "pish-pash," will prove a suitable food. A slice of good bread and butter, alternated with porridge, is also admissible; but milk is to be the chief nutriment.

As two years of age are approached, the quantity of meat allowed (about a tablespoonful of mince) may be gradually increased, but it should not be given more than once a day. As soon as it can be conveniently effected, the number of meals may be reduced to three, in addition to the cup of milk and slice of bread taken before early morning exercise.

Between two and three years the same foods may be continued, and a little stewed fruit occasionally added. As to vegetables, the potato is sufficient for all purposes till the age of three is approached, when vegetable marrow, asparagus, or young carrots may be introduced; but greens should be avoided till about four years of age.

General principles in feeding.

It will be seen that the various transitions have to be effected gradually and with great caution—a remark which applies more especially to the introduction of flesh food—and that milk must always constitute the staple element of the diet.

The habit of thorough mastication should be sedulously inculcated, and eating between meals as carefully avoided. Rest after a meal, for a short time, is always desirable, as all the nervous force is required for digestion.

Salt is an article which should be added in moderation to all meals ; but children should not be allowed to devour it at an immoderate rate, as many will, if permitted.

Sugar is perfectly harmless if allowed in moderation, but in excess it causes acidity and fermentation, and perverts the appetite. A moderate amount of ripe and digestible fruit may always with safety be given to a child over three years of age ; but nuts, dried and preserved fruits (except when stewed), should never be allowed. Very weak tea, largely diluted with milk, cannot do any harm after about two and a half or three years of age. Alcoholic liquors, in any form, should never be permitted to approach a child's lips, unless illness demands it imperatively. Most children dislike fat, and it should not be forced upon them. It is very apt to disagree. The sugar, of which they are naturally so fond, compensates to some extent for the smallness of the quantity of fat they eat.

CHAPTER X.

ON VACCINATION.

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CENTURIES ago small-pox had become a "naturalised plague" in England. In 1796 (the year of the introduction of vaccination) the deaths by small-pox exceeded 18 per cent. of the total deaths; about 1 to 4 of those attacked died, and more than half the blind people owed their privation to small-pox.

Inoculation.

Inoculation has been practised by the Hindoos from a remote period. About 1717, Lady Wortley Montague, the wife of the British Ambassador at Constantinople, had her son inoculated, and through her instrumentality the operation was introduced into England. "Then followed, under the sanction of the Royal Society, six condemned criminals; next five pauper children of St. James's; then the children of a few families of distinction; and to crown all, their Majesties, acting on the cautious advice of Sir Hans Sloane, had all the royal children submitted to the operation." (Guy). A greatly lessened mortality followed the introduction of inoculation, but it originated many epidemics, and was a source of great danger to others who approached the patients, the most virulent form of small-pox being capable of being transmitted from the mild inoculated form.

Vaccination.

On May 17th, 1749, the immortal Jenner was born, and it was he who in 1796 discovered vaccination, which is an operation whereby "the matter which forms on the udder and teats of the milch cow is introduced into the human body; only local effects ensue, with slight feverishness; the trifling affection is not

infectious ; it prevents the occurrence of small-pox in the great majority of cases, and when it does not prevent an attack it mitigates its severity as certainly as does a previous attack of small-pox " (Guy).

Its Results.

Writing of England, Dr. Guy says : " A fall from 3,141 per million per annum to 2,286 represents, therefore, the reduction of mortality from the reign of small-pox uncontrolled, to the rule of small-pox modified by inoculation ; and from 2,286 to 272, the superiority of vaccination with State patronage and aid, to inoculation without it. For the 10 years ending 1770, small-pox caused 108 deaths out of 1,000 deaths from all causes, and for 10 years ending 1860, it caused 11 per 1,000. In Berlin, before vaccination was introduced, 3,422 per million of the population died of small-pox ; since vaccination 176 so die." Recent facts at Leicester, says the *Lancet*, " are appalling in their simplicity." Of 281 cases of small-pox 126 were unvaccinated ; of these 126 no less than 83 were under 10 years of age, and in 9 of these the disease was fatal, whereas there was no instance of small-pox occurring in a vaccinated child under 10 years of age, and of the cases occurring in vaccinated persons there were no deaths.

Inoculation was a great blessing, but in the presence of vaccination it is a great evil.

Powers of vaccination

The powers of vaccination, like those of a previous attack of small-pox, are not absolutely unlimited. A second attack after the lapse of years is possible, though improbable ; and when it does come, it is usually " modified," or comparatively trivial, seldom bringing danger. If a person be vaccinated or revaccinated within three days after exposure to the infection of small-pox, the protective power of the vaccination will be exerted, and the person so exposed will most probably escape the disease entirely, because the incu-

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bation period of small-pox being twelve days, and that of vaccinia being only eight days, the latter is in time to anticipate the former.

The operation.

Vaccination, however, like everything else, requires to be done well to be efficient. An operation may be performed which conveys no immunity from small-pox, and a parent may rest in a false hope that his child is safe. Again, an operation may convey only partial protection. It therefore becomes us to enquire into the proper mode of operating and the means by which we can judge of success or failure.

Until within recent years, it was a common practice in districts for inoculation to be carried out from child to child. This is now, however, a method to be deprecated, as though the chances of inoculating a child with a severe constitutional disease are rare, it is in no wise justifiable when lymph can be so easily procured from any district station hospital; indeed, all that is necessary is that application should be made to the civil surgeon or vaccination officer of the district, who will send by post a few hermetically sealed tubes containing lymph. The skin should be first cleansed by rubbing it for a few minutes with a perfectly clean piece of linen or lint soaked in *only* boiled water. The site usually chosen for inoculation is either the upper arm or the inner side of the calf of the leg, if the infant be a girl. When required, the ends are to be broken off with the nails and the contents blown out upon the stretched skin. Then, with a clean, new needle, scratch the skin through the fluid, thus

Procuring lymph.

And repeat the process in two other neighbouring places.

Glycerinated calf lymph is now preferred, because it is free from the very small risk of conveying any infection that may attach to the arm-to-arm method, through carelessness ; and the writer recommends its adoption when possible.

When to vaccinate.

A child should be vaccinated within the first six months of its life, if it be in good health—delay represents unjustifiable risk ; in fact, it may be performed when three days old with advantage. The weather in India presents a difficulty at times, but not nearly so great as is imagined ; the operation may be done at all seasons. If small-pox prevails in the neighbourhood, no age is too early and no state of health, except of a very serious or acute character, nor of weather, should prevent vaccination.

The number of punctures made is a matter of great importance. Let all mothers bear in mind these two facts :—First, that in proportion to the number of vesicles which appear in response to the operation, is the general feverishness and disturbance less ; and secondly, that in the same proportion is the amount of protection gained. The Medical Officer to the Privy Council reported as follows :—

Cases of Small-pox.	Deaths in every 100 cases which occurred.
Unvaccinated	35
Said to have been vaccinated—no marks ...	23·57
Having one mark	7·73
,, two marks	4·70
,, three ,, ...	1·95
,, four ,, ...	0·55

Vaccinia.

How are we to know that the vaccination has "taken" ; that is, that it is successful ?—By the character of the vesicle. On the second or third day there will be seen

a slightly red elevation over each puncture, which is so distinct as to enable us to say that the case is a successful one. On the fifth day there will be a raised round bleb, with a depressed centre ; on the eighth day it is much larger, of a whitish pearl-colour, and distended with lymph,—around the whole, an inflamed blush. After this period the vesicle scabs and becomes brown and hard ; and about the twentieth day the scab falls off, leaving behind the vaccine "mark," which remains more or less permanent throughout life.

As the protective influence of vaccination gradually wears out in time—earlier in some individuals than in others—revaccination should be performed at puberty or better at about 10 years of age. Revaccination should be performed if it has not been successful previously on any particular exposure to infection.

CHAPTER XI.

GENERAL HYGIENE.

HOUSE, STABLES, SERVANTS, WATER, CLOTHING, EXERCISE, SLEEP, VENTILATION, LIGHT AND BATHING.

BEFORE dealing with the general Hygiene of the child it is very necessary that we should consider sanitation as it affects the house and its surroundings, for it is only by a close and intelligent supervision of the general conditions in and around the house, that one is able to prevent serious illness perhaps entering the home, for all communicable diseases are due to the invasion of the body by germs, each disease being caused by a germ special to itself.

Germs and disease.

Germs may enter the body by the mouth, either in water or food as in typhoid fever or by dust, that is inhaled and swallowed. They may enter through the broken skin of a wound, or by the bites of animals such as mosquitoes, fleas and ticks. In the following plates, Fig. 1 shows some varieties of germs, highly magnified called Cocci. Fig. 2 shows other varieties known as Bacilli.

Now these germs, Cocci or Bacilli, outside the body, are to be found in water, dust and dirt, and particularly in collections of decaying animal or vegetable matter. Hence it will be seen how important a matter it is for the parent to attend to the surroundings of his home, for insanitary conditions will lower the vitality of the household as well as favour the development of the germs.

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Selection and care of house.

Of course, it is not always possible for the householder to have a free choice of houses and sites. But there are certain conditions which should guide him. The house should not be in a low lying site, but should be raised and its flooring be of cement. There should be no hollows or pits in the compound where water can collect and form mosquito-breeding sites. All drains leading from the bath-room and the roof should be pukka and should be carried far from the house. Undergrowth and jungle should be all cleared away, as they favour the presence of snakes and mosquitoes, and there should be a space cleared and gravelled all around the house. The rooms should be light and airy and the walls clean and whitewashed. Special care should be taken of the bath-room that its floor is cemented and properly sloping. That its drainage vent leads to a proper drain and does not soak into the ground. Its ceiling is often dark and sloping with many nooks and crannies which favour the presence of mosquitoes ; if this is so, it should be regularly once a week wiped over with a mop soaked in kerosene. Every bath-room should contain a bottle of phenyle for disinfection purposes.

The kitchen and its necessity for inspection.

Special attention should be paid to the kitchen, the servants' quarters and the stables, for many an outbreak of disease has been known to start from an insanitary condition of one or all of the above. The kitchen should be near the house, its floor and washing tank should be uncracked and of sound cement. The walls should be regularly whitewashed, and the shelves regularly scrubbed and kerosened. If paper is on the shelves, let this be renewed every few days. That the cooking pots are scoured and kept absolutely clean, is an obvious necessity. The chopping board is another item which should be

carefully scraped and cleaned regularly. It is a common practice for the cook and his mate to keep their outdoor clothing, mufflers, or hookahs, in the kitchen hanging on a peg, or resting on a dekchi or side table whilst they are cooking. This is a dirty habit which is insanitary and should be immediately checked. Flies in a kitchen are a constant source of danger and should not be. We strongly advise that every kitchen should be provided with fly-proof gauze to the door and windows. Special care should be taken to inspect all around the kitchen. The sullage water drain should be accurately placed, so that it ejects into a proper receptacle without soiling the ground ; these receptacles should be cleared regularly and overflow never allowed. Flies always swarm around these receptacles, but if these are tarred and have a proper fitting lid with a hole in it for the drainage pipe, they will not. The cook should not be allowed to throw any refuse on the ground for flies to congregate on and hatch their larvæ ; sodden ground around a kitchen spells danger to health. The kitchen roof-drain should be of cement. Regular and thorough inspection of the kitchen, and its cook is one of the best safeguards of health in the household. Indeed, the interior of the cookhouse and the exterior of the cook should be neat and clean in every respect ; and the habit of collecting all sorts of extraneous substances in dirty bottles, tins and packages is to be greatly deprecated. The kitchen should be thoroughly scrubbed from floor to shelves and then kerosened at least once a week.

Its surroundings.

The stables should be also inspected, manure should not be allowed to collect, for it forms a perfect site for fly-breeding and collection. All such refuse should be regularly burned or collected by the sweeper carts.

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The horse box and its drains should be of cement or brick and should be kept clean and regularly phenyled. The stables should always be kept clean and be not too near the house.

Servants' quarters.

Servants' quarters should not be near the house ; they should be kept clean and airy and attention paid to their drainage ; no overcrowding should be allowed in them, nor should they be allowed to be used as dâk bungalows by friends and relatives, for disease is sometimes concealed or conveyed in this way. The sweeper should be separately accommodated. The bheestie should be provided with two buckets, or with two clean kerosene oil tins for fetching water for the kitchen in. Never should the bheestie use his mussack for bringing water that is going to be used for cooking or drinking purposes.

Wells and their care.

A few words may here be added as to the care of the water-supply if it is obtained from wells and not from standpipes. The wells which are used for the supply of drinking-water should be fenced round and animals guarded from their neighbourhood ; the platform should be of sound cement, and there should be a pukka drain to carry away overflow. Natives should not be allowed to wash on the platform of the well, that is used for the drinking supply. All wells in a compound should, if possible, have a mosquito proof-wire gauze over them always when the well is not being used by the bheestie. There should be no stables or fouling of the ground in the immediate vicinity of the well. A well should be periodically cleaned out. In the rains well water often becomes cloudy and thick ; this can be rectified by adding a half teaspoon of alum to the bucket or kerosene tin full and stirring, the sediment then all settles to the bottom. Water should not be used for drinking

without first boiling. *Filtering alone is insufficient and unreliable.*

SECTION II.—*Clothing.*—What are the general principles upon which a child should be clothed in India? In temperate climates we merely have to consider how best to keep the body warm; and for this reason we select as materials the worst conductors of heat, such as flannel and other woollen garments. During the greater portion of the year an opposite condition obtains in India,—we have to guard against heat; the skin is congested, it is irritable, it perspires freely, and evaporation is rapid. At another time of the year, particularly in the Upper Provinces, pure, dry, and piercing cold has to be encountered by the body, which has been but badly prepared by the previous heat to meet it. Again, there is the intermediate season of the rains, when the cooling of evaporation is absent, and changes are of constant occurrence. The first is characterized by the accession of heat, the second by its abstraction, and the third by the dangers which arise from chills. Manifestly, then, the clothing of the child is a matter of no small importance.

The different materials of clothing.

Clothing is made of either flannel, cotton, or linen. Flannel is a very bad conductor, cotton less so, and linen still less so. Of course, a bad conductor will not quickly take away the warmth of the body it enwraps, and therefore the heat is retained or kept in by the covering; but we have to admit, on the other hand, that a bad conductor will also refuse to conduct the external heat to the body, hence the wearing of a loose greatcoat to keep out the heat of the direct rays of the sun is no fallacy, and black, which absorbs rays, is hotter than white clothing, which reflects them.

Flannel.

Flannel is somewhat heavy, it is more or less irritating, and it is such a bad conductor that, although

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it absorbs the excessive perspiration, it does not draw away the heat from the body with desirable rapidity. From this it will appear that flannel is not an altogether suitable article of clothing during the hot weather, except when the person is exposed to the direct rays of the sun. In the rains, when evaporation is almost suspended, most flannels are so thick that they do not readily enough yield up their moisture to the air ; the body is then kept in a state of irritation and moisture, by which prickly heat and general discomfort are often produced. Notwithstanding these objections, most of the disadvantages can be overcome by the use of a single flannel garment without other clothing outside it. Indeed, then, it may be regarded as the best form of clothing for the child, as it protects better than any other from chills, and it is less liable to saturation ; but it is essential that the garment be loose so as to allow free ventilation and evaporation. Of course, much depends upon the selection of a suitable quality of the fabric. Any kind, if covered with layers of other clothes, is unsuitable for the hot weather and rains.

Linen.

Linen is altogether objectionable, because it becomes so soon saturated, because it conducts too readily the external heat to the body, and in a current of air it parts with its moisture so rapidly as to cause shivering ; whereas cotton is light, it is absorbent, it draws away more heat from the body than does flannel, and it leads less to it than linen ; but when saturated it clings to the body and may act as a tattee when evaporation is suspended in the rains and in damp regions.

So far, therefore, as the dry, hot weather is concerned, the advantages are with cotton. In any other weather, all the disadvantages are with linen. During the rains light loose flannel without other covering is the safest. In the cold weather flannel should be worn

under other suitable clothing, taking care that the child is not over-weighted and its exercise thereby impeded. Some of the gauze flannels are excellent in their properties ; but under the action of soap and water even the best of them become thick and harsh, when they require renewal, and this is expensive.

During the rains or other times of vicissitudes it is impossible to be too guarded regarding the suitability of children's clothing. We know from experience how we ourselves then pass rapidly from a state of excessive heat to one of chill, and it is but reasonable to conclude that the child or infant will, in proportion to its greater nervous susceptibility, become severely affected. In fact, during infancy and childhood, nature is less able to resist the external influences of temperature than in adult age, and no greater mistake can be made than the absurd notion that exposing the limbs of tender children to cold, from which we ourselves shrink, "hardens" them ; on the contrary, it is a cruel and dangerous practice, often not expressing itself openly at the time (though it sometimes does so in severe diarrhœas, bronchitis, and other inflammations), but covertly laying the foundations of slowly progressing wasting affections.

Danger of chill.

At night it is desirable to clothe children in flannel garments (jackets and trousers in one), because during sleep the temperature is lowered, and the punka-puller very frequently creates a vicissitude.

The foregoing principles hardly apply to young infants whose power of generating heat is so small that they can hardly be kept too warmly clad, nor do they suffer from the heat of the climate, a capacity which the older child possesses in a lesser degree, and apparently loses gradually year by year. The child has, on the other hand, much less ability to encounter and resist cold than the adult, a power which it by degrees acquires.

Difference between infancy and childhood.

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The clothing of a child should not, in India, be too frequently changed, as is sometimes the fashion, even when damp with perspiration, for chill is thus very apt to be induced, and the dampness soon returns.

SECTION II.—*Exercise and Sleep.*—Exercise produces waste of tissue, that is, expenditure. Sleep is the time of rest, when expenditure is at its lowest point, and renovation proceeds without interference. The more exercise, the more sleep. But exercise not only causes expenditure, it also causes all the vital functions, circulation, respiration, etc., to proceed with increased activity, which means that repair is at the same time more quickly conducted. On the other hand, without exercise the rejection of the old and reception of the new materials is not effected as rapidly as ought to be the case ; the old remains longer than it should, making no room for the new ; hence we have flabby muscles, a pale face, and impaired health.

The young infant requires exercise, as well as the growing boy or girl. In India a baby may usually be sent out-of-doors, carefully wrapped up, after it is a fortnight old. The nurse should not be allowed to sit down and gossip to her friends, as is the ayah's wont, when she takes the baby out to "eat the air," because the motion to which it is subjected by her action in walking represents to it proper and necessary exercise. Even when in the house, an infant should not be left lying too much on its back in bed, but should be carried about in the arms frequently in slightly varying positions. Too prolonged lying flat upon the back proved to be one of the principal causes of mortality in the Foundling Hospital of Paris, by producing congestion and inflammation of the lungs, all the blood gravitating to the back of the chest. "Change of position and gentle movements are as necessary for the

Exercise and fresh air important.

health of the internal organs as for muscular development" (Churchill). The clothing of an infant should always be sufficiently loose to permit of the free play of its limbs, its kicking about being exercise of an important nature.

A child should not be taught to walk ; such exercise, before nature has fitted the bones to bear the weight, will do harm, and may produce deformities ; rather should he be permitted to discover his own way to the use of his legs. Boisterous play is essential to the health of children ; by it the lungs are expanded and the muscles of the chest—all the muscles, in fact—are brought into full action. Riding is admirably adapted to Indian children ; it creates a manly spirit, and makes a thorough and exciting change in the routine of the day.

Children who are prevented making any noise in a house, who are restricted to a single room, and who are merely sent out for the dreary daily walk, do not get a sufficiency of exercise to maintain health. All children should be sent early to bed, so that they should be up and out betimes in the fresh morning air (before which they should have had a cup of milk and a slice of bread). A child should not be disturbed from its morning sleep in order to send it out. Send him to bed early, so that he will awake at the desired hour himself. When a child is sickly, much harm may be done by sending him out too early. "Persons," says Scoresby Jackson, "who are not in robust health should not, as a rule, take exercise before breakfast ; a mistaken zeal on this point frequently subjects children of delicate constitution to unnecessary cruelty." All children up to three and a half or four years of age should sleep one or two hours in the daytime ; but not immediately after a meal, nor yet immediately before one. When

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possible, children should sleep in upper rooms which are thoroughly ventilated, but free from all draught.

SECTION III.—*Ventilation, Light, and Bathing.*—In the hot weather the European child is necessarily confined to the house during a great part of the day, but in the cold season it spends most of its time out of doors, and the houses are then more or less wholly thrown open. On the whole, the European child in India is extremely favourably situated as to fresh air—a circumstance which no doubt has a great deal to do with the low death-rate of those who are well cared for.

Fresh air.

The importance of ventilation during the first days of life has been already adverted to, but something more needs to be said on the general subject.

The air consists of certain gases, chiefly oxygen and nitrogen, the former being its vital principle, the latter merely affecting a proper amount of dilution ; keeping it at the right strength, in fact. When we breathe, the carbon from the lungs combines with the oxygen of the air, and forms carbonic acid—a gas which, in very minute proportions, about three volumes in 10,000, exists in all air for the support of vegetable life ; but this carbonic acid gas, when doubled by respiration, becomes very injurious to health. But besides the formation of carbonic acid gas by respiration, we also spoil the air by breathing out a quantity of animal matter, which floats about imperceptibly. Now, bad as it is to breathe an air loaded with carbonic acid gas, the animal matter is really very much more injurious and dangerous. A mouse if put under an inverted glass will soon die, because it rapidly exhausts all the oxygen from such a small space ; but even if precautions be taken to supply it with a full proportion of oxygen by chemical means without permitting ventilation, death will just as certainly ensue, because

it will be poisoned by the accumulating organic matter.

Two poisons, then, are produced: the first, or carbonic acid, is known popularly under the name of "choke-damp;" and the second is, in large quantities, as we see, a deadly poison.

"The breathing of vitiated air for even a few hours produces," says Parkes, "increased temperature, quickened pulse, furred tongue, loss of appetite, and thirst, for even forty-eight hours afterwards. The continued respiration of the same quantity of air renders it at length a deadly poison."

English nurseries are, as a rule, tolerably well looked after, but even there overcrowding produces its effect. A report to the Obstetrical Society says: "A nursery of three or four children never does well. The air becomes foul, and they all droop and fall away in flesh, even with the best food, attendance, and cleanliness."

An adult will spoil 1,000 cubic feet of air in an hour. A child, no doubt, will vitiate a smaller quantity, but the difference is not so great that it is to be practically considered. An opening $3\frac{1}{2}$ inches each side of a square will admit, without draught, 1,000 cubic feet per hour. A chimney or other similar opening will suffice for the exit. This is the least size of ventilating opening necessary for each individual; but in India, in the cold weather, ventilation is practically unlimited. In the hot weather all the conditions which regulate ventilation in temperate climates are reversed, the hot air being without and not within the house. Although the doors must of necessity be closed during daytime, the houses are very roomy, the rooms all open into each other, the outer doors are frequently being opened, and all night every aperture is thrown open. Children should occupy the largest room. Drying clothes at a

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fire in a nursery should never be permitted. All soiled clothes and napkins should be removed instantly from the dwelling-house.

The latter is a most important matter. If the mother does not see to it herself, the ayah is pretty sure to go to very little trouble about it; indeed, the mother is often quite satisfied if the soiled napkins be removed to the other side of a bath-room curtain, or door which is being constantly opened. Highly injurious gases are largely emitted from such soiled linen. Another filthy practice of ayahs in charge of nurseries is to empty chamber utensils upon the pucca flooring of the bath-rooms.

Soiled napkins should be at once thrown into a vessel of water kept for the purpose, and removed from the house altogether.

Children are not likely to suffer from want of *light* in India; but light is sometimes too much shut out of the nurseries of the upper classes. Glare may be excluded, but not light. Want of light bleaches humanity as well as plants, and diminishes vitality.

Importance of the bath.

Bathing.—All the evils which arise from exposure to cold through insufficient clothing may very easily be acquired by injudicious bathing. It is not necessary to enter into a description of the innumerable pores of the skin, the necessity for keeping them free, and, through them, preserving the function of cutaneous respiration, which is absolutely essential to perfect health, because personal cleanliness in India is, on the whole, well attended to.

It is not only external dirt that has to be removed by the bath, but that portion of the internal waste which finds its way out of the body through the skin, and which, when permitted to accumulate, blocks up the pores, and forms a much worse kind of dirt. In

India the skin is called upon to do more of this sort of work than in England ; in fact, the skin is, in India, a more important structure.

Every morning, immediately after the early walk, the child should have his bath, which should, in infancy and early childhood, be tepid, so that there be no great shock conveyed. Especially during the hot weather and rains, tepid water should be used, but the temperature should never be such as to render the bath so agreeable that the child desires to prolong the operation unduly. It is quite true that the cold bath may be used by children with much less risk than by the adult ; and it is equally true that many children may with great security be bathed daily in cold water ; but, as a rule, the liability of the internal organs to congestion in India is sufficient to make it a risk. Even in a temperate climate, when for larger children the cold bath may be the proper thing, there must, for the moment after bathing, be an increase of the blood sent to the liver, spleen, and kidneys ; but under such circumstances the constitutional vigour is sufficient almost instantly to re-establish the natural distribution. It is not so in India ; the internal organs cannot so readily free themselves again, and a permanent congestion may be established.

Every day, in sickness or in health, a child's body should be cleansed in every part. Sometimes it may not be possible to place a child in a bath : then it should be sponged, limb by limb. When it is not thought judicious in very severe illnesses to run even this slight risk of chill, it is seldom that frictions with oil, a very efficient means of cleansing the skin, will not be admissible.

Bath or Sponging.

There are other objections to the use of cold water for bathing children. Except when the body is

suffering from the unnatural heat of fever, the effect of cold water is depressing. It is true a stimulating effect succeeds, but in order to ensure this latter it is essential that the bath be very brief, hardly sufficient for the cleansing of the skin of a child who has been actively engaged all day in a hot climate, and the dressing must be very rapid. In neither of these matters are ayahs to be trusted, and if they are neglected, chilliness and languor ensue ; that is, a weakening shock without any reaction is endured.

The water of a child's bath should never be below 70° temperature. During the first nine or ten months a blood heat is desirable. A greater heat is likely to be injurious. A very hot bath is not only injurious, but actually dangerous.

If a child evinces any terror of its bath, a good plan is to place a sheet over the tub, so as to conceal the water. The child is then to be gently lowered into the water upon the sheet.

PART II.

The Nature, Mode of Spreading, Prevention and Detection of the Illnesses of European Children in India.

CHAPTER XII.

THE NATURE OF THE SICKNESSES WHICH MOST PREVAIL.

(1) ACCORDING TO SEASON. (2) ACCORDING TO AGE.

SECTION I.—*Sickness according to the Season.*—In determining the sicknesses to which a European child in India is liable, and against which at certain seasons and certain ages it is necessary to take precautions, the statistics of soldiers' children afford reliable information, in that these children are sufficiently exposed to the climate and other peculiarities of life, and yet are not so well cared for as to influence the results of Indian residence ; nor are they so very badly cared for as to vitiate the value of the lessons taught. For these reasons the following summary is based upon their records.

The most unhealthy months are July, August, and September—one-third of the total admissions and about one-third of the deaths then occur ; and December, January, and February are the healthiest months. A gradual rise to the beginning and fall from the end of the first-named period is marked by the figures with singular regularity. The increase of mortality and sickness is coincident with the advent of extreme heat and damp.

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As to the kind of sickness to be apprehended and specially guarded against each month, and the attendant fatality, the following general statement will suffice for the present purpose. *January* is a healthy month ; but those children who, during the continuance of the rains, had been so much affected with fever or malarial influences as to leave the general health injured, suffer much from the cold. In such subjects, fever is apt to recur upon exposure ; or although only ailing during the rains, never having had actual fever before, they may now for the first time be attacked (as frequently happens to children sent to the hills for the benefit of their health), as though the malarial poison, which before had found a gradual exit through the skin, is now accumulated in sufficient force to develop fever. Great precautions are, therefore, necessary to clothe such children warmly, and to prevent exposure to night air. Under undue exposure to cold, existing congestion of the spleen will increase. But it should always be remembered that the cold weather is a season of blood-making, wherefore it is incumbent upon the parent to allow his child to be as much as possible out-of-doors. Fevers give the greatest number of admissions, though *primary* malarial fevers are uncommon. Next in order of frequency, we have the debilitated cases remaining from the hot and rainy weather, the cold often telling severely upon such children. Diarrhœa is, in healthy children, in abeyance, and is readily amenable to treatment. Cases of this affection now occurring are manifestly traceable to bad management, unless they be in a chronic form and the result of malarial debility.

January.

The child is liable to bronchitis and other chest affections, though not so much as during the rains. During this and the other cold months there is liability

to measles and whooping-cough, which increases till the rains set in. So far as figures are concerned, dentition would seem to be peculiarly easy, but many illnesses which occur duringe th more unhealthy months are attributed to teething, wherefore much reliance cannot be placed upon statistics in this particular.

February is the most healthy month of the whole year, but chest affections are more common than at any other period, particularly among children between one and two years of age. The cold weather has continued sufficiently long to have produced a marked effect, and to have diminished the number of general debility cases. Fevers are more uncommon than at any other period of the year. Head affections and convulsions are infrequent. This is a month in which the child should spend most of his time out-of-doors and at play. February.

March.—There is a marked increase in the number of cases of bowel complaints. The accession of heat increases the number and fatality of cases of convulsions and head affections. Measles becomes more frequent, but it is not fatal. There is a danger of infection of small-pox, owing to the native practice of inoculation during the cold season. The fevers increase, probably owing to improper exposure to the sun. Dysentery becomes an item of importance. March.

April.—Diarrhœa and dysentery become still more formidable and fatal, being four times more common than in January. Fevers continue to increase and to yield an appreciable mortality. Chest affections are rare: croup is uncommon. The danger of small-pox infection continues. Cases of convulsions from high fever produced by exposure to the sun are common; or, such cases running a more rapid course, may April.

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terminate as infantile paralysis or fatally as heat apoplexy. The malarial debility cases, if properly nourished, improve, on the whole.

May.

May seems to be a somewhat healthier month than April, the constitutional shock of the sudden accession of heat having passed off to some extent; and the greater intensity of the heat, compelling greater care and less exposure, no doubt helps to the general result. Head affections and dentition continue to yield results very similar to those of April. Fevers retain their April position. Dysentery and diarrhœa give somewhat fewer admissions, and they cause fewer deaths, by half. Chest affections are uncommon. The depressing effects of heat are much felt. The want of house-room, or anything like overcrowding, will serve to produce very baneful effects. Great care is necessary that children get a sufficiency of air and play. They may with safety be permitted to prolong their airing after dusk. The mid-day sleep, in a pure atmosphere, is now very essential.

June.

June.—A considerably less healthy month, the rains in the lower provinces having commenced. Measles and whooping-cough reach a climax. Fevers, and consequently debility cases, increase considerably. Bowel complaints cause the greatest loss of life, but fevers also prove fatal. Debility cases are quite 30 per cent. more common than in February. The cooling which was produced during the hot dry months by evaporation is absent, consequently the heat is felt to be particularly depressing; but the air itself is cooler than it was, therefore we can and should admit fresh air more plentifully, and this is necessary to the cooling of the body. Once the rains have set in, exercise should not be prolonged into the dusk of the evening.

July.—Still more unhealthy. Great increase of fevers and bowel complaints. Diarrhœa, convulsions, and debility are the chief causes of death. Infectious eye complaints prevail among the natives, and are to be avoided. Cholera causes a considerable mortality. July.

August.—The most unhealthy month of the whole year, and the most fatal. Cholera rife. Diarrhœa and dysentery at their climax. Convulsions and illness attributed to dentition cause many deaths. Cases of bronchitis not infrequent, owing to vicissitudes, and they are prolonged by the weakened state of the constitution, and probably by the night exposure. Infectious eye complaints very common. This month seems to be favourable to croup. August.

September.—Some improvement in the general health. The nature of the sickness and the fatality remain much the same as in August, except that the number of fever admissions increase, but the mortality and total number of admissions decline slightly. September.

October.—A marked improvement. The admissions diminish by one-fourth and the deaths by one-third. Fevers still prevail to the same degree, and are nearly as fatal. Cholera mitigated. Bowel complaints diminish very greatly. The month seems to be unfavourable to the development of croup. Convulsive affections and dentition cause fewer admissions and deaths. Measles has declined to its lowest point. October.

November shows a slowly continuous improvement. The diminution in sickness and mortality is maintained, but fevers give a high mortality rate, and are prevalent. Bowel complaints incline to diminish. November.

December.—Great diminution in both admissions and deaths. Malarial fevers reduced by from one-half to two-thirds, dysentery by one-third, and diarrhœa December.

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by two-thirds upon the rates of the previous two months.

Such is a very imperfect sketch of the year as it affects the European child in India. In glancing over it, one cannot but be struck by the absence of any mention of such affections as consumption, scarlet fever, or small-pox.

A very cursory attention to these details will show that care will be able to effect a great deal—in fact, to alter the whole story from the present narration to that which Payne and Fayrer relate of the European child in Calcutta.

In order of frequency the most common diseases are—

1. Fevers, during the rains and in autumn. Preventable to a great extent by avoiding exposure, by suitable clothing, the use of mosquito curtains and the prevention of mosquito bites.

2. Diarrhœa and dysentery, with the first accession of hot weather, and during the rains. Largely preventable by attention to diet.

3. Eye affections, during the rains. These should not be known in any well-regulated nursery.

4. General debility does not observe seasons, but is frequently the result of Nos. 1 or 2.

5. Measles, at the end of the cold weather. Prevented by avoiding infection.

6. Chest complaints, at the end of the rains and in the cold seasons. Prevented by avoiding exposure, and by proper clothing.

7. Dentition (so called) bears a ratio to the intensity of the heat, by which nervous susceptibility is increased. Chiefly to be avoided by preventing violent diarrhœas and fevers.

8. Convulsions during the hot season and rains for the same reason. Means of prevention the same.

The most fatal affections are in due order—

1. Debility and wasting.
2. Convulsions.
3. Illnesses during dentition.
4. Diarrhœa.
5. Fevers.
6. Chest affections.
7. Dysentery.
8. Head affections.
9. Tabes mesenterica.
10. Croup and diphtheria.
11. Measles.
12. Whooping-cough.

N.B.—Cholera is here omitted.

It is not necessary here to enter into an exact comparison between the kinds of sicknesses which prevail in India and England. In illustration, however, of the vast difference that really exists, it may be mentioned that in England scarlatina heads the list of fatal diseases for the 2nd, 3rd, 4th and 5th years of life. Whooping-cough stands second for the 3rd, 4th and 5th years. Inflammation of the lungs is third for the 2nd, 3rd, 4th and 5th years, and bronchitis is 4th. Now these diseases hardly count at all in the Indian bills of mortality.

SECTION II.—*Sickness according to Age.*—Regarding each period separately, we find that *under* 6 *months* of age the total mortality of soldiers' children is from about 240 to 260 per 1,000. Diarrhœa, convulsions and debility, at that time, cause most of the deaths; but it is very difficult to judge how far each of these may not have been really a part and parcel of some other, for a case is naturally returned under the heading for which it came under treatment. I believe diarrhœa to be the chief originator of the others, and that the lamentable loss of life of soldiers' children even at this age is due to that truly preventable affection; at all events, it is certain that these causes of death are rare among the English infants of Calcutta, and that if they

Under 6 months.

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were similarly scarce among the soldiers' children, the statistics of the latter would be referred to as a proof of the healthiness of India to the European child, instead of being used to demonstrate its unhealthiness. We have a practical reply to the questions—Can they be removed? Is it mere theory to affirm they can, or is it really practicable? In short, remove this great blot, and reduce the mortality of this period to the Calcutta civilian scale, and the whole question would bear a different aspect.

In a former chapter we have seen that 17,000 infants are sacrificed in England above the Scottish standard because of a simple difference in the matter of feeding. In this respect the soldiers' wives chiefly err. A very large proportion of the children born to them die at this age; and of these, probably half succumb to affections which are mainly preventable, representing that number of lives wasted. *The practical lesson here taught is that which has been frequently inculcated throughout these pages, and which, at the risk of being tedious, is again repeated—feed a child only on milk till the first dentition, and let that milk, if possible, be its mother's.* The thick satisfying foods mean death. A child at this age is of course liable to croup, bronchitis, and whooping-cough, but these affections run a mild course in India; and there is a singular exemption from cholera.

Great mortality preventable by care in feeding.

From 6 *months to* 1 *year* the total mortality is about 150 per 1,000. The soldier's child's chance of living is increased by about one-third upon the former period. Bowel complaints still claim a large proportion of victims, convulsions are twice or three times less fatal, and dentition is credited with a large ratio of deaths. Anæmia and debility during this and the succeeding six months cause more deaths than at any other period

of the child's life—a condition usually indicating malnutrition consequent upon ignorant and injudicious feeding, though some such cases arise no doubt from malarial fever. The child becomes more liable at this age to dysentery. There is greater liability to brain affections than subsequently. In fact, the nervous impressionability is so high that teething, if there be general mismanagement, produces a high mortality. The digestive organs still require tender care. The liability to chest affections is increased, and cholera comes upon the scene, though very sparingly as yet.

From 1 *year to* 18 *months.*—Total mortality varied from 124 as an average for all India to 171 for Madras in 1891. Diarrhœa reaches its highest fatality. Dysentery holds its own. Brain affections and convulsions slightly decline. The proportion of deaths attributed to "dentition" remains much as during the former period. Chest affections are more formidable than at any subsequent time, the child being able to expose but not protect itself either by exercise or intelligence. To whooping-cough and measles there is full liability. To the fevers of the country there is considerable liability (16 per 1,000 dying from them). Cholera becomes an appreciable item of mortality; and the liability to croup increases.

From 18 *months to* 2 *years.*—The mortality is reduced to one-third of the former period; the child's digestion being much stronger, it is able to utilise the foods which before tended to kill it; therefore we find diarrhœa reduced by one-half and dysentery by one-fourth of their former fatality. The nervous excitability is lessening, and the period of first dentition is for the most part over, therefore the liability to convulsions and brain affections are much less common. The child is able to take exercise; wherefore chest

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affections recede in number and seriousness. The cholera liability increases, but measles and whooping-cough are less fatal.

From 2 to 3 years.—Mortality now about 30 to 40 per 1,000, though twenty years ago it was more than double the former figure. The cholera mortality is doubled. Measles is more prevalent. Dysentery becomes more frequent and formidable. Diarrhœa, with increasing age, becomes less dangerous, though there is still special liability to it, and it is the principal cause of death. Chest affections are tolerably common. Convulsions and brain affections diminish much. Measles is common.

From 3 to 4 years.—Total mortality about 20 (from 17 in Bengal to 35 in Bombay in 1891) per 1,000. Cholera liability still further increased. Measles less fatal. Convulsions and brain affections claim but few victims. Dysentery increases, and diarrhœa decreases. Chest affections less frequent and fatal, the child being more capable of exercise and self-care. Fevers increase in seriousness.

From 4 to 5 years.—Total mortality about 15 per 1,000. Malarial fevers prevail. Diarrhœa becomes an inconsiderable item. Cholera liability continues. Convulsions and brain diseases uncommon. Croup liability continues.

The figures given above have been allowed to stand as in the former edition, though to be accurate now they would need modification. The object is merely to convey a general picture.

CHAPTER XIII.

ON THE SPREADING OF DISEASE, INFECTION, AND DISINFECTION.

CHILDREN'S sicknesses, of an infectious nature, are more common in England than in India,—particularly is this so with regard to scarlatina and whooping-cough; but we meet with all the European varieties in India, though to a less extent. They include the following:—Scarlatina, whooping-cough, measles, small-pox, diphtheria, typhoid fever, dengue, influenza and erysipelas.

Some of these diseases are capable of being spread by means other than those which are ordinarily termed infectious,—as, for instance, typhoid fever through the medium of water and flies; and scarlatina and diphtheria have both been largely disseminated through the agency of milk, many of those attacked never having been near sick individuals.

Contagion an infectivity.

There are other affections which are spread almost wholly through the instrumentality of water, and are not therefore in the popular sense of the term infectious; such are cholera, dysentery, and some kinds of intestinal worms.

Again, there are certain diseases termed malarial, which are not in any way transferable from individual to individual, except through the media of mosquitoes.

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Infection.

What is infection? By the expression "infectious" we mean the capacity of a sick individual to propagate his disease to others; but of the infection itself, that is, of the actual agent, we knew very little till comparatively recently. Formerly the air surrounding a patient was known to be tainted; some impalpable change was vaguely supposed to have occurred in it. But now, through the labours of scientific men, we have been led several steps in advance. We now know that infectious diseases are multiplied by germs which are given off from those who are ill, and which, attacking bodies of others, produce the same diseases in them.

The important points to know are, that the infective material is a congregation, more or less numerous, of living germs; that it consists of particles which, in some cases, have been isolated, seen, and measured; and that the particles possess life.

The late Professor Tyndall stated the case thus plainly and popularly:—

"From their respective viruses you may plant typhoid fever, scarlatina, or small-pox. What is the crop that arises from this husbandry? As surely as the thistle arises from the thistle seed, as surely as the fig comes from the fig, the grape from the grape, the thorn from the thorn, so surely does the typhoid virus increase and multiply into typhoid fever, the scarlatina virus into scarlatina, the small-pox virus into small-pox. What is the conclusion that suggests itself here? It is this—that the thing which we vaguely call a virus is to all intents and purposes a *seed*: that in the whole range of chemical science you cannot point to an action which illustrates this perfect parallelism with the phenomena of life—this demonstrated power of self-multiplication and reproduction. There is, therefore, no hypothesis to account for the phenomena but that which refers them to parasitic life."

The specific fevers do not recur—one attack protects from a repetition. A number of theories have been

offered in explanation, but it would be out of place here to discuss the various views set forth.

The poisons of some diseases are very easily got rid of by ventilation alone ; but the viruses of such affections as small-pox and scarlatina will spread in spite of the freest ventilation upon finding appropriate resting-places, and they may thus lie dormant for long periods. The membrane of diphtheria and the skin-scales of scarlatina may be exposed to dry air for weeks, and still retain their potency. Cases are on record where, for years, old and uncleaned walls have retained and propagated small-pox.

The modes by which the disease germs enter the bodies of previously healthy persons are numerous. Biting insects such as mosquitoes, sandflies and bugs may inoculate them. The particles which are thrown off from the infected body pass into the air which may be breathed, or from the air they get into water or milk or other food, and thus gain access to the stomach, or they may light upon, or be conveyed by flies and insects to, a broken surface such as an ulcer or a wound, as occurs in cases of erysipelas or of lockjaw.

Infection and contagion.

The giving off of the infection takes place most actively from those parts of the infected individual's body which are the chief breeding-places of the particles. Thus from the skin and expectoration in measles ; from the mattery discharge and skin in small-pox ; from the mouth and skin-scales in scarlatina ; from the stools and urine in typhoid fever ; from the vomited matter and stools in cholera ; and so with others.

The ways in which diseases are spread through human agency are almost innumerable. The dhobie, if permitted to wash for others, may disseminate small-pox or scarlatina. The tailor, who is allowed to take away work to his wretched hovel, may ply his needle close to

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diseased persons. Convalescents, too early coming into contact with the healthy, afford the most common means of propagation.

The living nature of the disease particles being understood, it becomes quite evident that if we can destroy them or their vitality before they find an appropriate soil for their further growth, we prevent the spread of the particular disease. To accomplish this end we endeavour to deal with the poison at the seat of its origin, as far as it may be accessible to disinfectants, in conjunction with other preventive measures, such as ventilation and guarding against the entrance of the poison into water, but as these matters cannot well be separated, they had better be discussed in detail under the heading of each disease in the next chapter. We must, however, also adopt general measures, and of these we now proceed to speak.

To guard against disease.

Sick-room and its care and disinfection.

As to the Sick-room.—An abundance of fresh air should be admitted, a large room selected, and no curtains, carpets, or tablecloths allowed, light should be admitted freely, unless the nature of the case requires otherwise; slops and stools should be instantly removed; soiled linen should be placed at once in a solution of lime chloride, perchloride of mercury or carbolic acid or izal, and as little communication as possible allowed between the sick and other inmates of the house. Other children should be removed to a distance; and should the patient die, speedy interment should be adopted.

Disinfection of the Empty Room.—After removal of the patient, all windows should be thrown open, all woodwork should be thoroughly washed with soap and water to which carbolic acid (1 pint to 4 gallons) has been added, and the furniture afterwards removed into the open air. All fabrics should be placed in a

solution of chloride of lime or other strong disinfectant as above in the room, and then removed from it. The walls should then be brushed, and when the dust has blown away or subsided, every window and door should be carefully closed. Then a sufficiency of sulphur (gunduk) should be procured and placed in different parts of the room upon open earthenware dishes, and set alight. The quantity of sulphur required will be about ½ seer for every 1,000 cubic feet of space (a cube measuring 10 feet in all directions). For about 8 hours the room should be kept closed ; then throw it open for 24 hours. If the walls are whitewashed, they should be scraped and re-washed, carbolic acid having been added to the whitewash.

Clothing and other materials, its treatment.

Disinfection of Clothing.—Compressed steam, when available, is the best means of accomplishing this ; an extremely dry heat is also a very efficient mode ; but except in large towns, where special apparatus exists, these plans are usually impossible. A baker's oven might be improvised, by placing sand upon its floor to prevent injury to the clothing, which should then be suspended upon lattice-work within the oven. But by properly conducted soaking and boiling, the object may usually be effected. By adding 1 gallon of the strong commercial solution of chloride of lime to 20 or 30 gallons of water, or adding 6 oz. of the powdered chloride to a gallon, or making a solution of carbolic acid (1 pint to 100), we get a good solution, in which infected clothing should be soaked for 24 hours, after which it should be boiled and dried. But these solutions will injure delicate fabrics. Fumigation with sulphur is another method of purifying clothing. The articles should be suspended in small closed chambers, and a large quantity of sulphur set on fire beneath them. Mattresses should be pulled to pieces,

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and their interiors destroyed by fire or thoroughly fumigated.

The following summary* may be usefully inserted here :—

Disinfectants.

DISINFECTION.—A few suggestions as to the means for carrying this out effectually will not be out of place in connection with the management of infectious cases.

I. CARBOLIC ACID.—Useful for disinfecting sinks, W. C., etc. (a wineglassful to half a pint of warm water); and for washing walls, furniture, etc. (a wineglassful to a pint and a half of water). Also used as spray (1 in 40), as soap (10 per cent.), and as carbolised oil for anointing the skin in scarlet fever (1 in 60).

II. CHLORIDE of LIME (Bleaching Powder).—Must be kept in a dry place. Add 1 lb. to 1 gallon of water for sinks, W.C., drains, etc. A weak solution (1 oz. to 1 gallon of water) may be used for *quickly* rinsing soiled linen before being wrung out in clean water.

III. CONDY'S FLUID (Permanganate of Potash).—For sinks, utensils, washing floors, etc. (one tablespoonful to a pint of water, or one wineglassful to a gallon). The solution is useful *only* so long as it retains its pink colour. Linen should be *quickly* rinsed in it, lest it should become stained.

IV. SULPHATE OF IRON (Green Copperas).—1 lb. dissolved in 1 gallon of water for drains, utensils, W.C., etc.

V. SULPHUR (Sulphurous Acid Gas).—For disinfecting unoccupied rooms. Tightly close the windows, ventilators, fireplace, etc., pasting slips of paper over cracks if necessary, and stuffing a sack of chaff or shavings up the chimney. Care must be taken to employ *enough* sulphur (1 lb. to each 1,000 cubic feet of space—PARKES), and, if the room be a long one, the sulphur should be divided into two or more portions. Place the sulphur in a tin or iron dish, large enough to hold it all when melted; place the dish on a brick or other support in an iron pail or common earthenware pan; pour some water into the bottom of the pan, to receive any melted sulphur which may run over. The sulphur is then to be ignited (by pouring a little spirits of wine on to it and lighting it), the door closed, and the room left for eight to twelve hours. The room may

* Appendix B to "A code of Rules for the prevention of infectious and contagious diseases in schools, being a series of resolutions passed by the medical officers of the Schools Association." (J. and A. Churchill, London.)

then be cautiously entered, windows, etc., opened, fire lighted, and the walls, furniture, etc., washed with the dilute carbolic solution, or with hot water and carbolic soap.

VI. CHLORALUM is also useful. TEREBENE and SANITAS (fluid and powder) may be conveniently employed in the sick-room and about the patient.

VII. HOT AIR.—Wearing apparel, bedding, etc., must be baked at a temperature of 220° to 300° F. for at least one hour.

VIII. HOT WATER.—All linen suspected of infection should be *boiled* at the wash. Superheated steam is used for disinfecting clothing, bedding, etc., by means of special apparatus.

N.B.—*Carbolic Acid and Sulphurous Acid Gas* may be used together, but neither should be used with Condy's Fluid, Chlorine Gas, or the Chlorides (as Chlorine of Lime).

All disinfectants should be regarded as Poisons.

CHAPTER XIV.

THE CAUSES AND PREVENTION OF THE MORE COMMON DISEASES.

"THERE are two modes," says Dr. Parkes, "by which we may attempt to prevent the occurrence of disease." 1. By conforming with the general rules of hygiene, by which the health is maintained at the point most capable of resisting disease. 2. By investigating and removing the causes of disease. The precise cause of some diseases is not perfectly understood. Then "we must act, as in so many other affairs, on probability, and endeavour to remove those conditions which, in the present state of our knowledge, seem to be the most likely causes."

WASTING.—This condition is curable at almost any stage "by conformity with the general rules of hygiene," more especially those laws which have been explained in Chapters VI and IX. Wasting is not a disease, it is merely a symptom, and in the case of young infants it is, in the great majority of cases, a symptom of mal-nutrition. Extreme thinness, absence of fever, a yellow dry skin, cold hands and feet, whining, griping, often a ravenous appetite, and not infrequently diarrhœa and vomiting are the symptoms. Something is pretty certainly wrong with either the quantity or quality of the food, and it has been already explained that either error means starvation, or starvation *plus* irritation. Chills, overfeeding, or a dirty feeding-bottle may produce symptoms of gastric and bowel derangement, which, if not properly man-

Wasting: its causes.

aged, may occasion rapid wasting. A child who obtains its nourishment from a nurse whose child is much older may so suffer.

When older children waste away they should be examined for rickets or abdominal disease, and when still older (after five), consumption, diabetes, and worms should be thought of.

Malarial Fevers.—Malaria is that condition which makes the climate of India so obnoxious to the European. It used to be thought that the air of marshes exhaled a poisonous miasm, and that it was inhaled by persons inhabiting the neighbourhood, who thus became affected, but now the evidence connecting a particular kind of mosquito with the propagation of the malarial fevers is overwhelming, and it is quite certain that the violent attacks of high fever are due to the sporulation of the tens of thousands of plasmodia which exist in the blood-current. These all ripen and burst at the same moment, setting free the poisonous contents of the cells which produce the phenomena of each attack. Some kinds ripen every twenty-four hours, others in forty-eight hours, and so on, and then we term the cases quotidian, tertian, etc. It is when the sporules are free in the blood that quinine proves so fatal to them.

Malaria.

As malaria is not met with 3,000 feet above the sea-level, removal to such a height, when it can be adopted, is an obvious means of prevention. The mosquito-net should be used habitually during sleeping hours. When the locality cannot be left, the choice of a well-ventilated house which is raised some feet from the ground-level, situated on the highest attainable spot, and removed as far as possible from marshy ground, is a matter which should not be neglected. Manson recommends the occasional fumigation of the rooms

The prevention of malaria possible by sanitary measures.

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with the dried flowers of the chrysanthemum. Dense herbage in the compound should not be allowed, though trees, which do not impede the ventilation of the house or of the soil, are beneficial. All jungle should be cut down. All rubbish pits should be cleared, and their contents burned or buried, and then the pits should be filled up. No collections of water should be allowed. Cess-pits should be emptied and regularly kerosened once a week. Proper drains should run from the bath-room outflow. It is a common thing to find a sodden filthy condition of the ground, around the cook house and the bath-room; this favours the multiplication of flies and mosquitoes. If there is a well in the compound, its platform should have a proper drain and the well itself should be covered by mosquito roof gauze. During damp weather the very early morning and night air should be avoided. Chills undoubtedly are capable of developing fevers of this type; but without previous infection they cannot of themselves originate a malarial fever. They certainly are an exciting cause of outbursts in India. The administration of quinine in small doses is the only preventive known, so far as medicines are concerned. Warm clothing, observance of the precautions above enumerated, and the partaking of food before exposure, are other and important accessory means.

Cholera.

CHOLERA.—All evidence opposes the idea that cholera is infectious, *i.e.*, that its poison is exhaled from the body. From this it might be thought that the cholera patient may be approached with impunity. This is not altogether so, for it is certain that the motions and vomited matters of cholera patients are the most powerful means of conveying the poison. "It cannot," said the late Sir J. Simon, "be too distinctly understood that the person who contracts

cholera in this country (England) is, *ipso facto*, demonstrated with almost absolute certainty to have been exposed to excremental pollution; that that which gave him cholera was (mediately or immediately) discharged from another's bowels; that, in short, the diffusion of cholera among us depends *entirely* upon the numerous filthy facilities which we let exist, and especially in our larger towns, for fouling of earth, air, and water; and thus, secondarily, for the infection of man, and whatever contagion may be obtained in the miscellaneous outflowings of the population." Therefore, when treating a cholera patient, the destruction and disposal of the evacuations should receive special attention. The vomited matter and stools of a cholera patient soon dry up and become capable of diffusion in the air, whence infective particles may enter the bodies of other persons, or, adhering to their clothes, they may be carried about: hence it is necessary to avoid those who are stricken with the disease; and children should be removed from the vicinity. But the particles may be conveyed into drinking-water, or by the wind or flies into food. The chances of imbibition through the air are not great, if we judge by the very small number of attendants upon the sick who are attacked. Spreading through the medium of water is the most common. Numerous facilities for the pollution of water exist in India. Macnamara affirms that when cholera stools are added to water, the water becomes capable of disseminating the disease when certain microscopical forms of life appear; but not till then, and not after their disappearance. The cholera germ is capable of preservation in an active state for a very long time if kept dry, as it may be in soiled clothing, or in the soil. When it gains access to a suitable place, its virulence is called forth. Such, in a few simple

Destroy excreta.

How the disease is spread.

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words, are the conclusions to which laborious investigation has led.

Its prevention.

The measures for prevention are, therefore, obvious. (*a*) Firstly, the most scrupulous attention should be paid to the drinking-water. "If," writes Dr. Macnamara, "we can only establish the principle that nothing but freshly and properly filtered or boiled water shall be consumed by the inhabitants of a town, barrack, or house, not only when at home but when at work—at all times, in fact, when cholera is abroad—we may, I believe, discard all and every other means of preservation." (*b*) The sources of the food-supply should also be carefully attended to. Foods should not be procured from infected neighbourhoods if they can be got elsewhere. Milk should not be procured from an infected bazar, but the cows should be milked at the door. The possible contamination of milk with foul water should be recollected. (*c*) Should it have been necessary to touch a cholera patient, careful ablution of the hands should follow every such contact. Great care should be observed that the fingers be not inadvertently conveyed to the mouth after touching a patient or any article which has been in his use.

Food and milk.

Diarrhœa predisposes.

(*d*) As diarrhœa has been proved to increase the predisposition to cholera, all irritating articles of food should be avoided during a cholera period, and all diarrhœa ought to be at once checked by astringents.

Disinfection.

(*e*) But most important of all is the destruction by disinfectants of the evacuations both from the mouth and bowels. These should be received into earthenware vessels containing earth. The moment the evacuation is thus received, it should be treated with a strong disinfectant, added without measurement and with a most liberal hand, such as very strong solutions of carbolic acid, or chloride of lime, or perchloride of

mercury. Sulphate of copper or sulphate of iron, both of which are obtainable in the bazar, may also be used; or, in the absence of any of these, quicklime should be employed. The next thing to do is to dispose of the disinfected evacuation, which is still to be considered dangerous, though possibly it may not be so. Destruction by fire is the best means. Deep burial in the soil, at a distance from any source of water-supply, is the next safest course. (*f*) The clothing worn by the patient should either be destroyed by fire or thoroughly disinfected (p. 133). Robustness of health is no safeguard against cholera.

THE ERUPTIVE FEVERS.—As to the prevention of small-pox, the reader is referred to the section "Vaccination." Of the other fevers of this class we know very little regarding their prevention, further than that good sanitary conditions lessen the chances of infection. Avoidance of a source of infection is an obvious measure; and the isolation of the sick, an imperative duty. An equally needful precaution is the adoption of the measures detailed regarding the management and disinfection of the sick-room and clothing.

In addition to the above, the following special measures ought to be carried out during the progress of cases.

Measles.—The skin should be daily rubbed with oil, or camphorated oil, as soon as scaling commences, and the application should be continued until the surface has wholly resumed its natural appearance. The expectoration should be received in a vessel containing Condy's fluid, or a solution of carbolic acid, and the clothes should be disinfected before being sent to the wash. Measles.

Scarlatina.—The throat and the skin are the points to attack in attempting to disinfect a case of this most Scarlet fever.

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infectious disease and its subtle poison. From the commencement the skin should be rubbed with oil, Eucalyptus oil has been recently most highly recommended, or with carbolic acid, 1 part, in olive oil 50 parts (one teaspoonful sufficing for the whole body), with the object of preventing the breaking-up of the minute scales and their diffusion in the air. All expectoration should be received in a vessel containing Condy's fluid or sulphurous acid. Gargles of Potassium Chlorate and Bicarbonate of Soda should be constantly used. The strictest isolation and freest ventilation are imperatively called for. The clothing and bedding had best be burnt, or if this be objected to, they must be disinfected.

Small-pox.—Oily applications will be found both useful in preventing infection, and grateful to the feelings of the patient. The wonderful length of time which the germs of small-pox will retain their potency should be borne in mind as regards the thorough disinfection of every article of the patient's clothing, and of the room he has inhabited. Even after exposure to and reception of the infection, vaccination, if resorted to within three days of such exposure, will ward off an attack.

WHOOPING-COUGH.—Avoidance of those suffering from this highly contagious affection, and the isolation of the infected, are the only known means of prevention.

Water & Flies.

TYPHOID FEVER.—In this affection the poison enters the system in much the same manner as does that of cholera—chiefly through polluted water. And there is also absolutely undisputed proof now that the disease may be carried by means of flies, usually the common house-fly. These flies are to be found wherever there is putrid or decaying material, or food. They alight on

such, their legs have a sticky excretion to which the typhoid germs or bacilli adhere, and thence they fly off and may alight on any food which is not kept in fly-proof cases. For instance, butter, milk, meat, etc., may thus be infected. Flies then are a very great source of danger, and their presence in numbers is an absolute indication of an insanitary condition either in the house or about the cook-house or servants' quarters or stables and calls for immediate remedy. The syce or sweeper may be to blame, but more often it is the cook-house, for the cook may be lazy or dirty. A common practice is to throw offal on the ground, around the kitchen on which flies swarm, or one may find the sullage water drain behind it choked or in a filthy condition, admirably suited for fly breeding. The medium, then, is either air or water or food. Of late there have been many instances of the multiplication of the disease through the agency of milk which has either been diluted with infected water, or allowed to stand in dairies, in close proximity to patients suffering from the disease.

Milk.

A well, for instance, in the neighbourhood of a cess-pit, or of a place which formerly had been a cess-pit, may yield a typhoid-producing water. The disease is to be regarded as contagious in the ordinary sense of the word, yet when introduced into a household or village it shows a decided tendency to spread, just as cholera does. It is very certain that a privy used by a typhoid patient becomes a source of danger to healthy persons who resort to it; the dried-up discharges polluting the air, the germs gain access to the bodies of others and infect them,—probably through the media of flies, or the infected dust being blown about, infecting the water-supply. The disease is contagious, usually through the excreta, and it is a common thing for a young

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nurse to become infected from neglecting to carefully disinfect her hands after attending to a patient.

Its prevention.

It becomes clear, this being so, that attention to the water-supply, its source and purification, and the disinfection of the bowel evacuations together with due attention to sanitary conditions of the surroundings of the house and the absence of flies are the principal measures for preventing a spread of the disease. Of late it has been proved that the urine contains the germs of the disease just as much as the stools, and therefore demands the same care as regards disposal and disinfection. "Be lavish," said Budd, "in the use of chemicals rather than run the terrible risk of failing by default."

Convalescents may be "carriers" of the disease.

Again, here it may be mentioned that it has been proved conclusively lately that a patient recently convalescent from typhoid fever may be a disseminator of the disease through his stools and urine for a long period after he is to all intents and purposes cured and well.

A privy or water-closet used by an infected patient should be thoroughly sluiced and disinfected. In fact, all the precautions called for in cholera are here just as applicable.

To the unthinking it may seem almost ridiculous to suppose that such widespread diseases as cholera and typhoid fever are spread almost exclusively through the medium of the bowel evacuations; but, writes Dr. Budd, "every year in England more than 1,00,000 human intestines, diseased in the way already described, continue each, for the space of a fortnight or thereabouts, to discharge upon the ground floods of liquid charged with matters on which the specific poison of a communicable disease has set its most specific mark."

Causes.

DYSENTERY AND DIARRHŒA.—The causes of these bowel complaints may be briefly stated to be the following :—(1) Impure water, which may bring on

either complaint in children very readily. The greater the amount of organic impurity, the greater the chances of dysentery as opposed to diarrhœa. The selection of a good water or the boiling of all doubtful water obviates this danger. (2) Impure air is a well-known cause; particularly noxious is the air from sewage matter, the effluvium of privies and cesspools, but "of all organic effluvia those from the dysenteric stools appear to be the worst" (Parkes), wherefore it is most important that dysenteric evacuations be rapidly disinfected, and that they never be retained longer in the house than actual necessity demands. The fumigation of rooms in which dysentery patients have been treated ought always to be carried out. (3) Improper food may directly cause bowel complaints by producing irritation, and indirectly by mal-nutrition of the body, whereby an unhealthy state is engendered, which is likely to expend its force upon the bowels. The denial of vegetables and fruits in the diet, for instance, is very apt to originate a scorbutic taint, which will induce dysentery of a most unmanageable nature. (4) Exposure to wet and cold frequently causes such congestion of the bowels as to produce diarrhœa, if not a state of inflammatory dysentery. (5) Malarial fever is often attended with diarrhœa or dysentery. In such a case the only means of prevention is to treat the malarial state.

Sunstroke.

HEAT APOPLEXY AND SUNSTROKE are caused by excessive heat and stillness of the surrounding atmosphere, or by direct exposure to the sun. These causes may also produce serious fever. Exhaustion during exposure to heat increases the liability. The means of prevention are—(1) to prohibit exposure, (2) to arrange the clothing rationally taking care to allow the chest full play, and carefully to guard the head and neck from direct solar heat; (3) to allow plenty

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of cold water at all times for drinking, as being a powerful means of reducing body heat by its direct cooling effect, and by increasing perspiration and evaporation.

Ophthalmia.

OPHTHALMIA is a very contagious dirt disease. The matter secreted by the eyes of the sick rapidly dries, and small fragments may be blown into the eyes of others—a direct inoculation, in fact. Avoidance of any source of danger is the plain precaution; but should it occur in a household it may usually be prevented spreading further by taking precautions that towels or water which have been employed to wash the sick be not used for the healthy—a matter in which native servants are not to be trusted, that the sick be segregated as far as possible; that the freest ventilation be adopted, and the utmost cleanliness observed.

Convulsions.

CONVULSIONS.—The most common causes are—(1) improper food, and (2) fevers occurring during the early years of life. As to the first of these causes Sir Wm. Jenner writes of the children of the poor :—

"For the first two or three days after birth their tender stomachs are deranged by brown sugar and butter, castor oil and dill water, gruel and starch water. As soon as the mother's milk flows, they are, when awake, kept constantly at the breast. And well for them if they are not again and again castor-oiled and dill-watered, and even treated with mercurials, for the poor have learned the omnipotent virtues of grey powder. After the first month bread and water, sweetened with brown sugar, is given several times a day, and during the night the child is, when not too sound asleep, constantly at the breast. As soon as the little ill-used creature can sit erect on its mother's arm, it has at the parents' meal-times 'a little of what we have,'—meat, potatoes, red herrings, fried liver, bacon, pork, and even cheese and beer daily, and cakes and raw fruit, and trash of the most unwholesome quality, as special treats and provocations to eat when its stomach rejects its ordinary diet."

By such treatment attacks are frequently induced directly; or indirectly, by producing diarrhœa and

consequent debility and bloodlessness. Adherence to the rules of diet already laid down is the means to prevent this catastrophe. As to the second cause, the measures detailed for moderating the temperature of the body in fevers are the only means of prevention.

Intestinal Worms.—The worms which may infest the bowels of children are of several kinds (*see* Worms).

As to the *thread* and *round worms*, there is little doubt that the young escape from the eggs soon after the latter are expelled from the bowel, and gain access to the human body with drinking-water or uncooked vegetable food, and there they propagate themselves.

As to the *tapeworm*, its early history has been accurately observed. Each segment of the worm (being bi-sexual) is fitted for reproduction. An impregnated segment becoming detached is expelled from the intestine. After a time it bursts and allows the escape of little embryos, each of which is provided with a boring apparatus having three pairs of hooks. These may be eaten by some animal, say a rabbit, or a pig, or an ox, with its food. Once inside the body of an animal, the embryo proceeds to lodge itself in the flesh by boring, and having selected a satisfactory home, it drops its hooks and undergoes transformation into a bladder-like form, producing the condition we know as "measly pork." When this measly flesh is eaten, the creature attaches itself to the inside of the human bowel, where the peculiar nutriment it meets with causes it to develop into a tapeworm. Many animals besides man are subject to tapeworms, and help to propagate the parasite in the above-described manner.

Prevention of worms.

Having regard to their development and manner in which intestinal worms gain entrance, the obvious means of prevention include (1) the purity of the

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drinking-water; (2) the thorough washing of all uncooked vegetables with a *stream* of pure water, to carry off all deposits from the surface; (3) the thorough cooking of all meat, and abstention from the flesh of the pig; (4) the daily use of salt with the diet is also found useful.

On other important points we cannot do better than utilise again the resolutions of the Medical Officers of Schools Association,* as well as the Report of the Committee appointed by the Clinical Society of London.†

Infectious Fevers.

Quarantine rules.

"XII.—The following quarantine times, after exposure to infection, may be considered safe *if thorough disinfection be carried out on the pupil's return to school*:—

Diphtheria	... 7	clear days' quarantine.
Scarlet fever	... 7	„ „
Measles	... 16	„ „
German measles (Rötheln, or Epidemic Roseola)	... 23	„ „
Typhoid fever	... 14	„ „
Chicken-pox	... 18	„ „
Small-pox	... 18	„ „
Mumps	... 24	„ „
Whooping-cough	... 21	„ „
Influenza	... 6	„ „

"2. Disinfection at home should not be relied on, but immediately on his return to school the pupil should be washed with carbolic acid soap (10 per cent.) from head to foot in a hot bath; and clothes, books, and everything brought back by him should be completely disinfected."

"XXI.—With regard to that most important question, 'When may a pupil who has had an infectious disease go home, or rejoin the school?'—the following are safe rules to adopt, provided patient and clothes are *thoroughly* disinfected.

"A pupil may go home, or rejoin the school, after—

* *Op. cit.*

† Supplement to Vol. XXV of the Clinical Society's Transactions.

"Scarlet fever—in not less than six weeks from the date of the rash, *if* desquamation have completely ceased, and there be no appearance of sorethroat.

"Typhoid fever—infection lasts till quite a fortnight after convalescence, but the poison may be preserved for months in clothes or other materials. A child is not fit to resume study for one or two months, according to the severity of the attack, but he may be sent home a clear fortnight after convalescence if thoroughly disinfected, and due care is taken to disinfect *for some weeks* all stools and urine, and clothes contaminated with such.

"Measles—in not less than three weeks from the date of the rash, *if* all desquamation and cough have ceased.

"German measles (Rötheln, or Epidemic Roseola)—in two or three weeks, the exact time depending upon the nature of this attack. A patient begins to be infectious two or three days before the rash appears, and continues so during the height of the disorder, after which it rapidly declines. Isolation should be imposed as soon as there is any suspicion of catarrh or malaise.

"Small-pox and Chicken-pox—when every scab has fallen off. The infection is much more intense during the height of the active stage than in the earlier part of the illness, therefore isolation should be put into force as late as the time of the appearance of the rash. Small-pox and Chicken-pox.

"Mumps—in four weeks from the commencement, *if* all swellings have subsided. Mumps.

"Whooping-cough—after six weeks from the commencement of the whooping, provided the characteristic spasmodic cough and the whooping have ceased; or earlier, *if* all cough have completely passed away. Whooping-cough.

"Diphtheria—in not less than three weeks (better say six weeks) when convalescence is completed— Diphtheria.

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there being no longer any form of sorethroat, or any kind of discharge from the throat, nose, eyes, ears, etc., and no albuminuria.

"Influenza—patient is infectious from the earliest moment till sufficiently well to return to his ordinary avocations.

Ringworm.

"Ringworm—when—the *whole* scalp having been examined in a good light, and any suspicious spot scrutinised with a lens—no broken-off stumpy hairs (which give evidence of the ringworm fungus when carefully examined under the microscope) are to be detected."

"2. It is sometimes considered that ringworm is cured when the hair commences to grow on the diseased places; but this is a mistake, for it frequently happens that diseased broken-off hairs remain, and the disease may thus exist for months or years. It is often very difficult to detect the short stumps which protrude only a sixteenth or an eighth of an inch; and it is quite useless to examine short cut-off healthy hairs from a suspicious spot, under the microscope, for the ringworm fungus."

The following table, as given by Dr. Newsholme of Brighton, embodies recent ideas upon the above subject:—

Disease.	Duration of infection.	Date at which school attendance may be resumed.	Duration of quarantine of children exposed to infection.
Scarlet fever	From 5 to 8 weeks; ceases when all peeling of the skin has been completed, and when the child is free from the nose or ear or sore places.	Not less than 8 weeks from beginning of rash, and then only if no sorethroat or sore places.	14 days.

Disease.	Duration of infection.	Date at which school attendance may be resumed.	Duration of quarantine of children exposed to infection.
Diphtheria ...	At least 21 days; often much longer. Absence of infection should be confirmed by bacteriological test.	Not less that 2 months, and not then if strength not recovered or if any sorethroat or any discharge from nose, eyes, ears, &c.	12 days.
Small-pox and chicken-pox	About 4 or 5 weeks	When every scab has fallen off.	18 days.
Measles ...	From 3 to 4 weeks; when all cough and branny shedding of skin has ceased.	Not less than 4 weeks from beginning of rash.	21 days.
German measles.	2 to 3 weeks ...	From 3 to 4 weeks from beginning of rash.	21 days.
Mumps ...	About 21 days from the beginning.	4 weeks from the beginning.	24 days.
Whooping cough.	6 weeks from the beginning of whooping, or when the cough has quite ceased.	In about 8 weeks...	21 days.
Typhus and enteric fevers.	4 to 5 weeks ...	When strength sufficient.	28 days.
Influenza ...	2 to 3 weeks ...	1 month ...	10 days.

It will be observed that there are discrepancies between this table and the assertions previously made. Dr. Newsholme's deductions are based upon extreme caution, and are intended to cover those cases where the period of infection is exceptionally prolonged.

CHAPTER XV.

THE EXAMINATION OF SICK CHILDREN.

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Difficulties.

A YOUNG child no more understands what sickness is than that the world is round. When it first becomes ill it simply feels a strange sensation, but it is really aware of nothing. Information is only to be gained by observation, and whose observation can be so accurate as that of those who know its daily habits, and watch its every movement habitually? A strange voice, the very act of looking at it, may frighten a child greatly; while attempts at examination are resented in a way which very often makes investigation impossible. Before a doctor can do anything with a child he must gain its confidence, otherwise he is not likely to succeed; but in the mother the child reposes all confidence; to her he looks for protection, to her he clings when alarmed. It is the mother who is really favourably circumstanced to observe the first signs of illness.

A healthy child's limbs should feel firm and elastic. In acute diseases there is a sudden pause in nutrition, the first result of which is a soft condition of the muscles; rapid loss of flesh succeeding, if the disease is not checked. In chronic disorders, a loose flabbiness of the muscles, the result of diminished nutrition, is observed to come on gradually, and to be succeeded by slowly progressive emaciation.

Habitual coldness of the extremities (hands and feet) shows an unnatural feebleness of circulation.

It has before been shown that the nervous excitability of infancy and childhood is great. In a healthy child, who suffers from an acute febrile disorder, this excitability is still further heightened; and hence we have an unusual liability to convulsions. But a child who has been reduced by mal-nutrition or otherwise, loses to a great extent its normal nervous excitability, so that illness creeps upon it almost unobserved, the symptoms being obscured by a sort of apathy of the system.

The general *demeanour and the expression* of face will frequently give the first signal of indisposition. A flushed or very pale face, a disinclination to play, unusual crossness, and a disposition to loll about, are signs which bespeak illness. When there is abdominal pain or inflammation, a child will lie upon its back with its knees drawn up; and the under lip is then very often drawn in. The contracted brow, with pulling at the ears, tells us that there is headache. A general restlessness, with periods of prostration, a drawing in of the thumbs upon the palms of the hands, and a tendency to frequent startings, would induce us to apprehend the approach of a convulsion. Squinting, should it come on while the child appears to be generally out of health, should always be seriously regarded. The expression of a child suffering from bronchitis or inflammation of the lungs can scarcely be mistaken by those who have any experience,—the dusky colour, the quick breathing, the parted lips and dilated nostril. A child will frequently grasp at a sick part, as, for example, at its throat in croup. Lividity of the lips and around the eyes indicates imperfect aëration of the blood; but a faintly darkish tint of the eyelids and around the mouth indicates nothing more than a weak circulation, or perhaps only a bad digestion in a weakly child.

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The *fontanelle* is the opening which exists between the bones of the head of an infant. When in any illness the skin over this opening is felt to be depressed or saucer-shaped, we may be sure that the child is suffering from severe exhaustion, and that it stands in need of stimulants and supporting nourishment. On the other hand, should the fontanelle bulge upwards, and be felt to throb with force, there is probably congestion of the brain, and then we use purgatives, cold to the head, and baths.

The *cry* of a healthy child—loud, broad, and vigorous—cannot be mistaken; the repeated shrill, piercing shriek of the child in whose head mischief is working is quite characteristic. The long, low whine of irritation which accompanies deeply seated inflammation, and which no tenderness or care can subdue, is equally well known as also the hoarse whispering cry of laryngitis. A vigorous fit of normal crying, which petting will not overcome, is usually occasioned by flatulence or pains in the stomach. An infant sheds no tears till it has reached 3 or 4 months of age; but once the secretion has been established, their disappearance during crying in illness is a sign of some seriousness of import. On the other hand, their reappearance, after temporary cessation, is a sign of commencing recovery. Earache is very common in infants, and is a frequent cause of persistent shrill crying.

Sleep.

A perfectly tranquil *sleep* is natural to infancy; unquiet sleep, with tossing about, hurried respiration, and waking in a fright, probably caused by dream indicates feverishness; while sudden startings and grinding of the teeth will occur if the nervous susceptibilities are being worked upon. Heavy sleep is sometimes a normal sleep, and should be left

undisturbed, unless, indeed, any popular "soothing" medicine has been administered, when the condition is not to be ignored (*see* Opiates).

Stools.

The stools in infancy and early childhood are a very delicate index of the condition of the digestive functions. During the first couple of days of life the evacuations are of a black colour, but henceforth they should be of a bright yellow and thin in consistency. The bowels of an infant should be moved two, three, or it may be four times a day, during the breast or bottle feeding period. The stools subsequently become more formed and gradually assume a brown colour. Green stools are extremely common with any digestive disturbance in infancy. The green colour indicates some excess of bile secretion and an unduly rapid passage along the intestine; they are usually unhealthy in other respects showing undigested milk, perhaps in white clots, and traces of mucous. Mucous or slime with the stool indicates irritation of the bowels, and when there are streaks of blood intermingled with the slime, we may be sure, we have an actual inflammation to deal with.

Soft putty-like white evacuations indicate liver derangement with non-passage of bile.

Great or unnatural fetor of the motions argues indigestion, the digesting fluids not acting properly upon the contents of the intestine, but permitting decomposition before its proper time. Bloody motions accompanying fever are always indicative of an anxious state.

Puffiness and tenderness of *the abdomen* show that gas is being formed by decomposition within the intestines, and that there is a state of great irritation, bordering on inflammation; while a flaccid, retracted belly shows emptiness of the intestines and the

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absence of inflammation. Marked pain on pressure just above the right groin shows that irritation is passing upwards; and when there is, with it, chronic diarrhœa or dysentery, it is an anxious sign. If the "abdominal breathing" be increased, that is, if the child seems to breathe chiefly or almost wholly with its belly, attention should be at once directed to the chest, which the muscles of the belly are probably endeavouring to relieve. If the belly be wholly motionless, and the chest acting with unusual vigour, very probably there is some inflammatory complication of the abdomen. An unnaturally enlarged belly may be simply due to flatulence; sometimes it is occasioned by enlargement of spleen; but it always indicates something wrong, even though it be merely the result of bad feeding. It should not, however, be forgotten that the abdomen of a young child is naturally prominent.

The *urine* of an infant is copious and clear, but when there is feverishness or fever the urine is scanty and passed with unusual frequency, and it stains the napkins of a reddish colour.

The quantity of urine voided by a child is much more affected by heat and cold than is the case with the adult. Derangements of the liver affect the urine and urination often in a marked manner.

Vomiting.

Vomiting in an infant at the breast may be simply a mechanical act, indicating that too much food has been taken. Improper food may occasion a sudden attack of vomiting with diarrhœa; so may an approaching attack of ague, but then the symptom soon subsides. *Persistent* vomiting is always a symptom of importance. "In children especially, the existence of obstinate vomiting is indicative of head rather than of stomach disease" (Reynolds). The preliminary nausea, the foul

tongue, abdominal griping, and obstinate retching being signs of gastric vomiting, and the contrary holding good of head vomiting, serve to distinguish the one kind from the other. Besides these signs, if it be the stomach that is irritated, there is pretty sure to be diarrhœa ; but if the head be the cause, there is usually constipation. Vomiting, therefore, is generally either a very trivial or a very important symptom.

Pulse.

From the *pulse* of a young infant, the amateur is not likely to obtain much information. Even the physician seldom troubles to count it except during sleep, because the slightest excitement has a great effect upon its frequency ; but the *nature* of the pulse is an important guide to those who have experience. I will not here attempt to describe a series of nice distinctions, because such cannot be taught by words ; but it is not difficult to judge whether the beat is comparatively stronger or weaker than it was on the day before. It may be mentioned, lest the parent should be startled by its frequency, that the pulse at birth ranges from about 130 to 140 per minute ; and to the end of the first year is from 115 to 120, while even at two or three years of age it will be 100 or more, when the health is perfect. One thing may be said—that a very slow pulse is unnatural to childhood. "While the circulation is rapid, the skin, from its softness and vascularity, disperses heat rapidly ; the cooling agencies are at a maximum ; and the heat-maintaining powers (that is, resistance to depressing influences) are at a minimum' (R. Southey).

Respirations.

The *respirations* bear a definite proportion to the pulse, because the rate at which the blood is driven through the lungs of course regulates the quantity of air which is essential to yield it a sufficiency of oxygen —a certain quantity of blood requiring a certain

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quantity of air. The pulse beats about three and a half times for each respiration, of which there are 40 per minute in the sucking infant, but there are not so many during sleep. A marked change in the ratio is of importance; for instance, if there were only two beats to each respiration of a sick child, we should suspect a coming pneumonia. The breathing should be smooth and regular. By carefully listening to it while a child is sleeping, much information may often be gained. If it be possible to apply the ear to the naked chest, the full, deep, clear sounds of inspiration and expiration should be very plainly heard both before and behind, from the collar-bone and top of shoulder-blades to the lower edge of the ribs. Sometimes fat, full-blooded children breathe heavily, or with a sort of grunting sound, which can hardly be mistaken for diseased action, but it is as well to bear the fact in mind.

When the breath is drawn in with some difficulty and with a shrill sound, there is evidently narrowing of the entrance; and if, at the same time, there is a peculiar broken bell-like sound in the cough, probably there is some form of inflammation of the throat. When the lung is inflamed there is quick inspiration, the lips are kept apart, and the child is very restless, thirsty, and feverish. In bronchitis the respiration is more or less difficult, sometimes not greatly so, and there is a great deal of "wheezing," which will be heard as a crackling or gurgling sound when the ear is applied to the chest. The breathing may be simply quick from fever; but if rapid and accompanied by movement of the nostrils, there is usually bronchitis or inflammation of the lungs.

Unequal movement of the two sides of the chest—that is, if one side remain motionless while the other

expands fully—generally indicates something seriously wrong.

By placing the open hand firmly but gently against the side of the chest, a rattling may often be *felt*, in cases of bronchitis. But if, after a good cough, a rattling which previously existed disappear, the cause was only a temporary accumulation of mucus. If, however, it remain after coughing, and continue equally marked as before, it is a sign that a good deal of mischief exists.

Tongue.

In health the *tongue* is clean and the *breath* sweet. A whitish tongue indicates derangement of some sort, such as approaching fever, indigestion, etc. A dark-brown condition of the tongue is present in inflammations and severe fevers ; when, in addition to this latter condition, there is dryness of the organ, we may be pretty sure there is serious illness. A very red, flesh-coloured, raw-looking tongue indicates gastric or intestinal irritation. The tongue is itself liable to inflammation without any other diseased condition being present ; but then, its swollen state, ruddiness, and the absence of other symptoms will serve for recognition.

Breath.

Foul breath may have its origin in a simple disordered stomach or fever. Sometimes, with comparative health, the breath remains foul ; but there must be something more or less wrong while anything offensive can be detected.

Mouth.

Within the *mouth*, on the sides of the cheeks or lips, the irregular little white patches called "thrush" may occur. An inflamed patch, with an ash-coloured centre on the inside of the cheek, occurring in exceedingly debilitated children, or during a long and prostrating illness, is an alarming sign, for which medical aid should be sought without delay.

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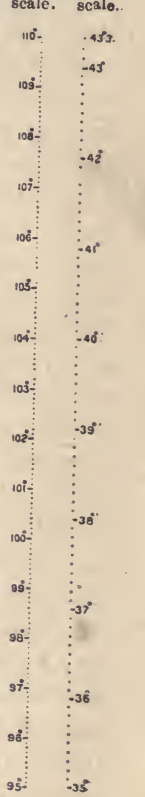
Skin.

The *skin* in the hot weather should always feel moist and cool. A hot dry skin, after exposure to great heat, should always be regarded as illness, and should be treated as such without delay. A dull, clay-coloured skin often accompanies the sudden accession of illnesses, such as acute diarrhœas and agues. A wax-like skin, with transparency of the ears, tells of bloodlessness; and a yellow skin, of jaundice. A flush over the cheek-bones on a pallid background, bespeaks hectic or wasting fever.

Bodily temperature. Centigrade.

The *temperature* of the body is a matter of great moment for variations from the normal indicate the existence, and the course of disease. Particularly is this so in the hands of the unskilled in disease, for here we have a matter of fact, free from all the errors into which mere opinion, judgment, and anxiety are apt to lead, by which we can often determine the import of other symptoms; and, after a few observations, ascertain whether the



case is one of mere indisposition, or whether the patient is suffering from disease, long before we could ordinarily guess without such assistance. No estimate of the heat of the body can be made by the hand; indeed, the most erroneous impressions may easily be conveyed to it. In the thermometer alone have we the means of ascertaining the temperature with accuracy.

The Thermometer.

The two most commonly in use are the Fahrenheit and the Centigrade. In graduating thermometers two fixed points of temperature are employed—these are the temperature of melting ice (the freezing point) and the temperature of steam at ordinary pressure, commonly known as the boiling point of water.

Kind and description of instrument.

In England the scale known as that of Fahrenheit is commonly adopted. In this the space between the freezing point (32°F.) and the boiling point (212°F.) is divided into 180 equal parts and each division is called a degree Fahrenheit. The Centigrade thermometer is the one in use on the Continent, and its use is gradually extending into this country. This scale is exceedingly simple and convenient—the distance between the freezing and boiling point is divided into 100 equal parts, and each division is called a degree Centigrade.

180 degrees of the Fahrenheit scale equal 100 degrees on the Centigrade scale. Thus one degree Fahrenheit is equal to $\frac{5}{9}$ of a degree Centigrade. The two thermometers are here placed side by side for the sake of comparison. A clinical thermometer such as is here represented should be in the possession of every one who has the care of children. The instrument is made wholly of glass, upon which the graduations are cut. In the Fahrenheit thermometer (the common one used in this country) between each set of figures there are five degrees (written 5°), each of the longer lines represent-

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ing 1°, and between each of these latter are five spaces, which therefore show fifths of a degree. It will be observed that the thermometer is narrowed towards its lower end, and that the minute central tube at this point becomes so fine as to be barely discernible. The object of this is to prevent the portion of mercury (A) which is detached in the tube from descending into the bulb (B); an accident which would spoil the instrument as a self-registering thermometer. In the diagram the detached portion is observed to register $96\frac{2}{5}°$.

How to read it.

If the bulb be grasped in the hand, the mercury will be seen to ascend the tube rapidly till it apparently strikes against the detached portion, which will ascend too, till the highest temperature of the part in contact with the bulb is marked. Now, if the hand be removed from the bulb, the lower part of the column of mercury will rapidly descend towards the bulb; but the detached portion will remain stationary, marking the highest temperature which has been attained; hence the instrument is called "self-registering," and the detached portion is called the "index." These instruments are now made so that the glass over the column of mercury magnifies it. In ordering one, ask for a $\frac{1}{2}$ minute, self-registering, clinical thermometer, with a magnifying index.

To set the thermometer for use again, it is merely necessary to grasp it by the upper end, between the forefinger and thumb, and swing the arm sharply around; by which motion the detached portion is jerked somewhere below the figure 95.

To use the thermometer: One arm should be removed from the sleeve of the night-dress, and all clothes kept away from the arm-pit. This should be done quickly and without exposure of the surface to

the draught of a punkah or other cold. It is very necessary that this precaution should be taken, lest the registration of a temperature below that of health should cause the parent to imagine that something terribly wrong had occurred; or the thermometer might, under such circumstances, record health when fever is actually present; or at least a lower temperature than it would indicate if fairly treated. The bulb of the thermometer is now to be placed deep in the middle of the arm-pit, and the arm itself drawn firmly across the front of the patient's chest. This position, with the thermometer firmly fixed, should be maintained for at least five or six minutes. The thermometer may then be removed and taken to a good light, where it may be read. In doing this the observer should be careful not to allow the bulb to come into contact with his own hand, nor should he read off the temperature in the direct rays of the sun. In older children it is more convenient to place the bulb in the mouth under the tongue, the lips being kept firmly closed the while. Three or four minutes will then suffice for an observation. In young infants, the easiest and most reliable plan is to pass the bulb into the rectum a distance of about an inch. The bulb should be first smeared with vaseline, or a little soap. The buttock should then be raised and the thermometer passed gently in and lightly held in position. When a child is sleeping the fold of the groin is a good locality to select. By gently bending the leg upon the abdomen, the bulb is completely covered and grasped.

A clinical thermometer is a delicate instrument, and should never be employed to ascertain the temperature of a bath or cleansed by being put in hot water, which will be sure to spoil it.

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Now as to the general information we can derive from the thermometer :—

(1) In the first place, the average temperature of the body in health is 98·7 degrees ; one or two subdivisions more or less will not signify.

(2) The temperature in health always reads a little lower in the mornings than in the evenings and varies with the way in which the temperature is taken.

(3) A rise above 100 degrees is a sure sign of some kind of indisposition, which is deserving attention ; and if the rise is persistent (*i.e.*, if it continue beyond 12 or 24 hours), we may be certain that an illness is coming on.

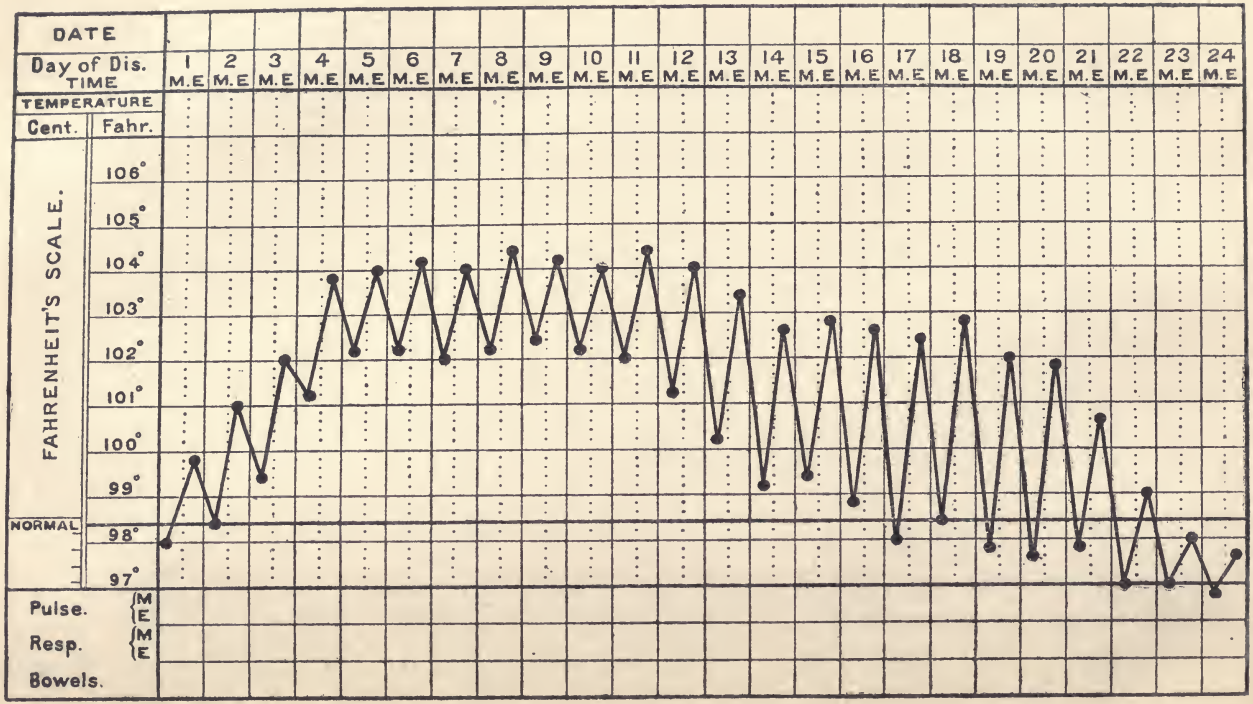
(4) If the temperature rise steadily at each observation (as compared with the figure obtained at the same hour on the previous day), we may be quite certain that the illness is gaining ground ; similarly, a daily decline indicates approaching convalescence. Should it go on increasing daily, till at the end of a week it has attained 104° or more, there is cause for anxiety. Still increasing, there is danger.

(5) A temperature as low as 95° F. is seldom found, unless towards the end of some exhausting illness ; and it indicates the necessity for artificial warmth, stimulation, and food.

(6) A very suddenly high temperature occurring in a child indicates either an attack of ague, or that there has been exposure to the sun. Unless precautions are taken, convulsions are then imminent. A *sudden* rise from the healthy standard is not of the same seriousness as a gradual increase up to a similar point, except in so far as the liability to convulsions is concerned.

(7) After an illness, though a child may apparently have recovered, he has really not done so until the

THE TEMPERATURE CHART OF A CASE OF TYPHOID FEVER.



temperature has become not only natural, but has remained so for several days.

(8) When, in the course of a fever or illness, the evening temperature becomes lower than that of the morning, it is a favourable sign.

(9) It should be known that a very slight cause will suffice to elevate a child's temperature. Dr. H. B. Donkin remarks that "the temperature of young children is very frequently raised some degrees, not only on admission to hospital, but on visiting days, the chart in many instances giving a fairly accurate record of these occasions. Fits of crying, moreover, convulsions, or other excitements are often accompanied by a marked rise of temperature."

Temperature Charts—The course of fever has certain characteristics in the different diseases. An accurate record of the temperature is of great assistance in deciding the nature of the fever. In Typhoid fever, for instance, the rise and fall of the temperature is in many cases characteristic.

A sample chart in a case of Typhoid fever is given here.

PART III.

The Child in Sickness.

DIVISION I.—ON FEVERS.

CHAPTER XVI.

ON FEVER GENERALLY.

ITS NATURE, TREATMENT AND CLASSIFICATION.

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THE term "fever" is a perfectly well understood one, implying elevation of temperature with a series of symptoms, heat of skin, thirst, a quick pulse, a flushed face, and scanty urine.

But a state of fever may arise as a mere symptom of a local ailment, such as the existence of a boil, the ingestion of improper food, etc. In these cases the febrile state is only a constitutional manifestation of a local complaint, and as such does not now engage our attention. At present we are discussing general fever as a state in itself.

Almost all fevers commence in the same manner, without at first any well-marked distinguishing characters. It would only be attempting an impracticable refinement to endeavour to indicate, point-blank, early differences which would serve for the recognition of each kind. It is quite true that there are in India some fevers which are capable of almost immediate detection by the aid of the thermometer and their

peculiar symptoms; and of such we shall speak presently. But in the majority of instances we only see before us a patient suffering from a state of fever, whose course we must carefully observe for a couple of days or so, before we find ourselves in a position to pronounce definitely as to its nature. This being so, it becomes very essential that we should have some clearly defined principles of action upon which to proceed to meet the emergency, with the best chances of leading it to a favourable issue, whatever its exact nature may ultimately prove to be.

Before we can act intelligently or usefully, we must have some sort of a correct idea of what we are dealing with, how it affects the system, what are the dangers arising out of it and how these may be best obviated.

What is fever?

Fever is an unnatural but veritable burning up of the body, the constituents of which are, through too rapid combustion, wasting away at an undue rate, while at the same time the assimilation of nutriment is so very slight as to be far from compensating for the loss thus endured. Thus results prostration, and an immense quantity of worn-out material is thrown upon the liver, spleen, and other organs, which their diminished powers are not able to dispose of, and their functions therefore become impaired. In this way arises further deterioration of the blood, of which all these organs are perfectors and purifiers. From malnutrition the brain and spinal cord become disturbed; they no longer are able to exercise complete control over the whole body. When the galvanic battery is out of order, the telegraph wires are of very little use. Hence the frequency of convulsions and other nervous affections during the fevers of children, whose nervous sensibility is so much proportionately in excess of that of the adult. Without entering into the theory (which

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is here unnecessary) of the febrile state, such, in general terms, are the salient points to be kept in remembrance by those upon whom the treatment of a fever case devolves. Whatever be the cause of a fever, whatever be the nature of the poison which initiated it, or whether there be a poison or not, the above statement of the case holds equally good ; and this is fortunate, for it gives us distinct indications as to the dangers incurred and the measures we should adopt to meet the emergency and guide it to a proper termination.

Treatment.

The objects of *treatment*, then, should be as follows :—

1. *To reduce the Excessive Heat of the Body.*—From such heat there are two dangers : firstly, that which may be called the immediate danger, the effect of heat as heat, by which the temperature of the brain and spinal cord may be so raised that they will no longer act naturally, the result being convulsions or complete paralysis (that is, death). Then there is the secondary or remote danger of enormous waste, which may eventually proceed past the powers of bodily endurance.

It is perfectly apparent that if we can but reduce the fire, the stove will not become red-hot, and less fuel will be consumed. So, if we can lessen the bodily heat, we remove or lessen both these perils, the first of which is to be apprehended when the temperature suddenly rises to 104° or over it, or when there are twitchings of the muscles and the other "warnings" enumerated elsewhere under the head of "Convulsions;" and the second is always present during the course of prolonged fevers.

The cold bath.

When we have indications of the advent of the serious effects of direct heat, the most prompt attention and energetic measures are demanded. By far the most efficient means for counteracting this danger is the use

of *the cold bath*, which should be fearlessly resorted to in such cases.

Whenever the temperature rises *in the course of an illness* to 104°, or whenever nervous symptoms threaten during a high fever, it is an imperative duty to resort to the cold bath, which should be administered as follows :—In all cases of *pressing emergency*, the water should be as cold as it is possible to procure it, the bath should be deep, the child should be immersed in the water up to its neck, and there detained for a period of about ten minutes. Should the emergency not be so great, the temperature of the water may be raised to a heat ten to twenty degrees less than that of the child's body, as measured by a thermometer, a blanket or sheet being spread over the bath, so that the water be invisible to the patient, who may then without shock and without fright be gently lowered into the bath upon the sheet. But the surface of the water should always remain uncovered to hasten cooling, and with the same object the water may be agitated, provided this does not frighten the child.

The effects of the bath so administered are invariable. After a few minutes the face will brighten up, the nervous twitchings subside, very constantly a motion is voided in the water, and after a short time the child, who before was but semi-conscious, will play with pieces of wood or toys which have been thrown upon the surface of the water. Whilst seated in the bath, food may be administered, and that which before was persistently and petulantly refused will now be freely partaken of.

After ten or fifteen minutes, or upon the occurrence of shivering, the child should be removed from the water, placed lying upon a sheet spread to receive it, and gently dried without rubbing ; perfect drying is

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neither necessary nor desirable. Then, covered by a single sheet, it is to be laid upon the bed, when it will usually fall into a quiet slumber, such as has been unknown to it since it became ill.

After a few hours—perhaps 4, 6, 8, or 10—the heat may possibly again rise to a threatening point. What is to be done? Repeat the bath without hesitation in precisely the same manner as before. A repetition, even several times within the twenty-four hours, is quite admissible and often very necessary. If the patient has borne the bath well, it may be desirable to prolong its duration to fifteen or twenty minutes. This may safely be done, and the effect will be of longer duration. Still the effects of cold bathing are more pronounced in children than adults and a prolonged immersion, beyond 10 minutes, may be followed by collapse. To obviate this danger a little brandy may be administered with advantage before and after the bath.

When not to use the cold bath.

Severe bowel hæmorrhage, or great puffiness of the abdomen combined with an exceedingly feeble pulse, are the only contra-indications to this use of the cold bath.

Prejudice against the bath.

I have entered thus fully into these details, because I know from experience that I am treading upon prejudiced ground in urging this advice. Popular objections to the proceeding seem to be—firstly, because of its comparative novelty; secondly, because of its apparent cruelty; and thirdly, because native opinion (and the ayah has a powerful voice, which she does not, in her ignorance, scruple to use on the distracted parent) is so vehement against either cold water or fresh air in cases of this sort. As to the first objection, it is no novelty, but a well-established remedial agent; as to the second, let the effects answer for themselves. The cruelty really lies in denying the means of relief; and as to the third, it is simply to be ignored. In practice I have found it almost useless to give directions. I almost invariably have had to do the thing myself in the first instance. When mere directions are trusted to, it will be found that some

excuse for non-performance is often urged, or a mere pretence was gone through with the object of justifying a prevarication to the conscience and to the doctor.

Prof. Whitla, speaking of typhoid fever, says: "Taking all the different reports from favourable and unfavourable reporters, one is safe in saying that the *routine* employment of the cold bath has diminished the mortality at least 50 per cent." Again, Sir William Broadbent writes: "Of special measures for the reduction of febrile heat when this is becoming dangerous, either from its intensity or duration, the first to be mentioned is the cool or cold bath. This should be resorted to in all cases of hyperpyrexia, from whatever cause; its efficacy, first established in the high temperature of acute rheumatism and enteric fever, has been proved also in cases of septic hyperpyrexia after ovariotomy, and even in injuries to the brain. Here the water may be positively cold. When the bath is used to control temperature, not dangerous from its height, but from its duration, as in enteric fever, the temperature need not be lower that 70° or 65° F."

Sponging the surface.

Sponging the surface of the body with water or vinegar and water (one part to three) is another means of reducing the temperature, but it is not sufficiently efficient to be relied upon in an emergency. In the treatment of prolonged fevers it is, however, of value as a means of soothing the system and keeping waste in check. Sponging may sometimes with advantage be employed to keep in check the rising temperature which is often observed a few hours after the bath has been used. The objections to sponging in the case of young children are, that it is annoying, and prevents that perfect repose which is so desirable. As compared with the bath, it abstracts heat in a very minor degree,

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wherefore it should never be regarded as a substitute. As a means of soothing and conveying comfort it is valuable, but no further.

The wet pack.

The wet pack is more to be relied upon, and will produce free perspiration often when lesser measures have failed. A large towel wrung out of lukewarm water is to be wrapped round the patient, and this is to be covered with a blanket, in which the patient is to be carefully rolled and tucked in. At first there will be a sense of chilliness, but reaction quickly sets in. Ten minutes will be sufficiently long for the pack to be continued. Then the patient is to be rubbed dry and returned to bed.

Cold drinks.

Drinking freely of cold water is an accessory means which should never be neglected.

Cold to the head.

The local application of *cold to the head* is a measure of value, and one which may be used in conjunction with others. It undoubtedly has a great effect, when properly used, in allaying nervous excitability and relieving head symptoms in hyperpyrexia; but as a cooler of the body generally it must not be expected to accomplish much. The thickly folded wet cloth, which is so commonly applied, is really a source of additional heat, for it soon becomes warm, and then acts like a poultice. A single piece of wetted muslin, which will permit of free evaporation, should be used, and an evaporating lotion employed, or, better still, an india-rubber ice-cap or bag (obtainable from the chemist) filled with broken ice.

Caution.

Ice should not be retained continuously in contact with an infant's or very young child's head. The bag containing it should be moved about the scalp gently, and thus it may be applied for five minutes or so, when it should be removed for an interval before repetition. Except in this intermittent manner, it is too powerful

a remedy. Wrongly used it might depress the nervous system too much.

Refrigerants.

There are certain medicines which have a cooling effect, and which are used merely as adjuncts as symptoms dictate.

It is to be remembered that fever is commonly a protective process. Drugs should rarely and then only by a medical man be used to check the production of heat. For the reduction of temperature we should merely rely upon those means which promote the dissipation of heat without influencing its production by the preceding measures.

Oil frictions.

Another valuable but comparatively minor means of cooling the body is by using oil frictions. It is a proceeding, the value of which the natives well know. Frequently, after a child has been removed from the bath, or after the interval of sleep which follows the bath, anointing of the whole body with warmed oil will be attended with happy results ; or when the temperature is only moderately high—from 100° to 102°—the proceeding will be found to convey comfort and relief. The skin will become soft, the irritability of the patient will subside, and there will be a tendency to perspiration, sleep frequently ensuing. If the patient has not had a bath, the potency of this remedy will be enhanced by a previous sponging of the surface.

Regulation of the bed-clothing.

While the body of a fever patient is dry and burning hot, it is a mistake to heap on bed-clothing in the hope of inducing perspiration. From what has been already said it will be understood that to do so is only to court all the dangers of excessive heat. The accession of perspiration will not be hastened. When perspiration commences naturally about the roots of the hair, on the forehead, and at the bends of the

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joints, some additional clothing may be drawn over the patient; to be further increased in proportion to the increase of perspiration.

2. Rest.

2. The second point of great importance in the management of a fever is *rest*, and in the case of children it is doubly essential. We have seen that fever is a great destroyer of the body substance, and we know that exercise is also a destroyer, wherefore it is plain that without rest the patient is not having a fair chance. By rest is meant the most perfect tranquillity of both body and mind. Every movement represents a certain expenditure, and so does every worrying thought. Without tranquillity, a fever may be unduly prolonged; or convulsions, with all their attendant dangers, induced; or serious exhaustion may be brought on at a critical period. Rest represents nourishment indirectly, in that through its instrumentality a certain quantity of body substance which would otherwise be expended is conserved for future use.

To attain tranquillity with greater certainty, it is often advisable to employ certain medicines, notably chloral and the bromide of potassium.

3. Ventilation.

3. The thorough *ventilation* of the apartment occupied is especially necessary, because (*a*) it keeps the body cooler; because (*b*) the disordered blood being less capable of absorbing oxygen from the air, the freest and purest supply is necessary; because (*c*) the chances of infection are thus lessened; and because (*d*) a limited ventilation is proved to increase fever mortality.

4. To meet the exhaustion.

4. *To restore Exhausted Nature.*—To endeavour to supply, to an extent compatible with vitality, the deficiency caused by the excessive bodily waste, is a point second to none in the management and treatment of a prolonged fever. To do this we must chiefly rely

upon the judicious administration of food. Nothing can be of greater consequence than that every possible particle of strength be retained by the patient. Under no circumstances should the parent risk a low diet. Let the food be as simple as you like, but, except under explicit medical guidance, never in any case of fever pursue a lowering plan. You know not how long the time the child may have to battle for life. You know not but that a single day's carelessness or mistaken action on your part may withdraw that small amount of reserved strength which, subsequently being found wanting, may turn the scale unfavourably.

Immense importance of feeding.

Medicines may materially assist our efforts, but they can never, even in ever so small a degree, supplant food and good nursing.

5. We endeavour to ensure the speedy *removal of all improper materials from the blood*—whether they be the products of the undue waste or of the nature of a fever poison—by the administration of medicines which will preserve or establish the action of the skin, the bowels, the kidneys, the liver, etc., as perfectly as possible. Hence we use moderate aperients, fever mixtures, diuretics, etc.

5. Purify the blood.

6. *Stimulants* are often necessary in the treatment of prolonged fevers ; but there are two kinds of stimulants, of vastly different natures, the one from the other. There is the medicinal stimulant and the alcoholic stimulant. The former (as examples, take camphor, ether, and ammonia) are simple pure stimulants in the ordinary sense of the term, and are often admissible at an early stage of a fever when there are signs of depression. They are comparatively harmless. The alcoholic stimulants (wine and brandy) are, as a rule, only useful after the fever has passed away and

6. Stimulants.

Medicinal and alcoholic.

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the body is left exhausted; or towards the end of a prolonged fever, when we observe "typhoid symptoms" —*viz.*, a dry, dark brown tongue, great prostration, trembling of the hands, and perhaps diarrhœa. Under such circumstances, the use of alcohol is not only justifiable, but it is usually essential. How far it is to be continued must depend upon the effects which it produces within half an hour or an hour after administration. A firmer pulse, ability to take more food, the relief of headache, a tendency to sleep, fall of temperature, clearer intellect, absence of the odour from the breath, and greater tranquillity of the nervous system, are signs which indicate that it is producing benefit and ought to be continued.

When to use alcohol.

7. Relief of distressing symptoms.

7. We endeavour to *relieve distressing symptoms*, such as (*a*) headache by the application of cold, in the form of a lotion (or the douche; or hot fomentations succeeded by sudden cold—a method which often succeeds). Sometimes headache calls for an ammonia draught, sometimes for more potent medicines. (*b*) Vomiting is relieved by sucking ice, by adding lime water to the food, by changes of food, by poulticing the stomach with mustard and flour, and by the use of effervescing draughts. (*c*) Diarrhœa is a symptom which should always be seriously regarded; for its treatment the reader is referred to another chapter. (*d*) Delirium at the beginning of a fever is usually an indication of excessive heat, but at the end of a prolonged fever it signifies want of nourishment, and perhaps even of alcoholic stimulation. (*e*) Sleeplessness is a symptom encountered by the administration of the warm bath, by oil frictions or bromide of potassium as medicine.

8. Special poison.

8. When the nature of a fever has been recognised, we endeavour to *neutralise its special poison* and to

meet its peculiarities by the various means which will be described further on. CHAP. XVI.

When a case of fever arises, *the first thing to be done* is to act upon the principles above laid down ; and the next is to observe carefully the course pursued by the fever as indicated by the thermometer and the general symptoms. By these means we discover the nature of the fever,—whether it be due to disease affecting the whole body or some part or organ.

Classification.

Acute specific fever.—The term is applied to those fevers which are due to a specific or special poison introduced into the body from without and which run a definite course. In all specific fevers the poison is of microbic origin. Classification.

These fevers are divided into groups according to the course of the temperature or from the presence of an eruption.

1. Continued fevers.—In these the fever pursues a continuously even course without interruption or marked daily abatement. Of this kind are—Enteric or Typhoid, Diphtheria, Influenza, Whooping Cough, Cerebro-spinal fever, Mumps, Rheumatic fever, Kala-Azar, Malta fever, some types of Malaria fevers.

2. Eruptive fevers.—The onset of fever in these cases is more or less abrupt and a characteristic rash appears after a few days. In most of these cases the temperature drops when the eruption comes out.—Measles and German Measles, Scarlet fever, Small-pox, Chicken-pox, Dengue, Erysipelas.

3. Intermittent fevers.—Fever in these cases is of an intermittent or remittent type, that is, the temperature drops at regular or irregular intervals to normal or nearly to normal.

Malarial fever or Ague may be taken as the type of this group.

4. Other fevers of uncertain origin such as Heat-stroke, Seven-day fever, Sand-Fly fever.

Each of these is treated of under its proper heading.

CHAPTER XVII.

GROUP 1—THE CONTINUED FEVERS.

TYPHOID OR ENTERIC FEVER.

Other names. Definition.

THE typhoid or enteric is a continued fever, of two or three weeks' duration (in children the duration is very variable), accompanied by successive crops of rose-coloured spots seen first on the skin of the abdomen, which may or may not be present, from the eighth to the twelfth days of the fever, and by great prostration and generally more or less diarrhœa but sometimes constipation. It is accompanied by a slight enlargement of the spleen and bronchitis. The force of the fever poison expends itself upon the small intestines, which in severe cases undergo ulceration, a condition which is not so uniformly met with as in the adult, though inflammation and swelling at the characteristic places are invariable. The disease having once occurred, sometimes conveys protection from a second attack.

Symptoms.

Before the actual symptoms commence, a period varying from one to two weeks elapses after the imbibition of the poison.

The disease may run either a mild or a severe course, and "the differences are so great between its milder and severer form as to warrant our adopting them as a ground for its subdivision into two classes" (West). A case of the *milder variety* will run such a course as the following:—The child becomes listless and disinclined to play. He is drowsy, desires to lie down, and his nights are restless. The skin may now

Of milder form.

CHAP. XVII.

feel dry, but hardly hot, yet the thermometer will show a temperature of 100°F. or so. On the second day the dryness and heat increase. (The thermometer will register a steady daily rise.) The urine now becomes high-coloured and scanty, the breath is apt to become offensive, and the back part of the tongue is observed to be thickly furred, while its end is unusually red and bright. Nearly always, the bowels are too loose, the motions being of a light yellow ochre colour, and smelling very offensively. The abdomen is a little puffed, the respirations are rapid, and there is frequently a short hacking cough. The fever subsides in the morning but steadily rises towards evening ; the face becomes flushed. The child is restless and during the night the sleep is disturbed by delirium. There is a constant gurgling of the bowels ; particularly is this noticeable after food has been taken ; and not infrequently there is some pain on pressure over the lower part of the abdomen near the right groin, and also sometimes over the spleen. Sometimes, and at irregular intervals, a perspiration may appear on the surface, but it soon passes off and brings no relief. Unless the case is very mild, the tongue, before white, now becomes brown, and the looseness of the bowels increases, and perhaps rose spots appear and the muscular wasting is considerable.

Commencement of recovery.

The duration of the fever is variable. All the symptoms continue with more or less force till the end of the second week, when the morning temperature (which is usually in sickness, as it always is in health, a little below that of the evening) will be found to have fallen as much perhaps as a couple of degrees. A rather sudden evening rise may be expected, but it will not attain the height of the previous evening.

Thus is initiated the commencement of convalescence, and at the same time the general symptoms begin to abate. But the disease may still continue till the end of the third week, by which time convalescence will in most cases have been fairly established. Great prostration and emaciation are left.

Termination of the illness.

In defining the disease, an "eruption" has been mentioned; but no stress has been laid upon it as a sign, because, although when it does occur it is absolutely distinctive of the fever, it is often very difficult to discover it, and to recognize when prickly heat is also present, and it is frequently altogether absent in children. It consists of a "few small, very slightly elevated rose-coloured spots, disappearing on pressure, each spot continuing visible for three or four days only" (Aitken). Generally they occur in crops, which appear and gradually disappear, to be replaced by others, and are to be looked for about the abdomen, chest, and back, between the eighth and twelfth days of the fever.

The eruption.

The *severer variety* of typhoid fever sets in with greater violence. There is drowsiness, vomiting, and sometimes a short shivering fit. The temperature may go up to 105° or 106° on the fourth or fifth day, giving rise to much brain disturbance. Bleeding from the nose is common. The tongue becomes dry, the belly distended and tender on pressure. The diarrhœa is more severe, and the stools are of a characteristic pea-soup colour, the emaciation is more rapid, and splenic enlargement more pronounced. It is often difficult to arouse the child from its lethargic condition. Deafness is a common symptom at this period. As the disease progresses the teeth and lips become covered with a black dry incrustation. Bronchitis is often a prominent symptom, so much so, that it may obscure the other

The severer form.

CHAP. XVII.

features of the disease. Notwithstanding the greatest care, the prostration is sure to be excessive by the time the crisis has arrived (at the end of the second or third week). Fortunately convulsions are not nearly so frequent when a high temperature is attained by a gradual process, as happens in this disease or in the course of any lengthened fever, as when excessive heat supervenes suddenly. Recovery from a severe enteric fever is always an exceedingly gradual process.

Temperature.

"The typical typhoid chart is the most characteristic feature of the disease. In the first week it is 'ladder-like,' gradually rising with diurnal remissions until it reaches about the end of the 1st week or 10 days, its highest point (103°—105°). During the second stage which may last a week or more, it remains continuously high, the diurnal remissions being only those that are met with in health. As the disease progresses, these daily remissions become gradually more and more marked, during convalescence, usually about the fourth week, first the morning temperature and then the evening temperature gradually become normal. Convalescence may be said to be established when the evening temperature has been normal for two successive nights.

Distinguished.

This disease, after the lapse of a few days, is readily distinguished by its symptoms. Commencing in the same way as most other fevers, an immediate recognition is often not possible; but there are special characters of its own which will serve to distinguish it, *viz.*, the preceding languor and drowsiness, the steadily and slowly rising temperature, the abdominal distention, the diarrhœa, the great prostration, and the rash if discovered. After the first week valuable information may be obtained by an examination of the patient's blood. The blood is sucked up into a little

glass tube from a prick on the finger. It causes little pain and no mother should object to the doctor doing this.

Enteric fever usually runs a mild course in childhood, and the majority of cases which are properly nursed recover satisfactorily. The following may be regarded as being signs of good omen :—A mild commencement, but little diarrhœa, absence of abdominal tenderness on pressure, a morning temperature not exceeding 101° to 102°, an evening temperature not exceeding 103½°, and a moist tongue ; and during the third week a morning temperature 3° less than that of the evening, which latter should gradually decline. If the opposite conditions prevail, there is cause for anxiety ; and if there is bleeding from the bowel or deep stupor, the case is extremely grave.

Prospects.

Favourable and unfavourable signs.

In the majority of cases the treatment is simple. The child must be kept in bed, its temperature carefully watched and its diet regulated.

But in addition there are points connected with the treatment of typhoid fever which demand special consideration. The first, and by far the most important, is the nursing. Nothing that a doctor may do or say will avail without good nursing. The life of the patient *always* depends upon the manner in which this office is performed. The nurse must be sufficiently intelligent to have some idea of the enormous waste of body material which is going on, and that at the same time the bowels are in a state of excessive irritation, if not of actual ulceration. While, therefore, it is of the greatest importance to introduce nourishment, we must be most careful to avoid irritating the bowels. Over-distention of the stomach, whether with food or fluid, should never be permitted. Small quantities given frequently is the rule to observe, the

Nursing.

Importance of.

Diet.

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great necessity for supporting the vital powers being ever kept in mind. Milk diluted with barley water or thin arrowroot whey or egg albumen constitute the best form of food. We should be in no hurry to commence chicken or mutton broth, or other form of animal food than milk. When exhaustion is great, soup may be given as an excellent stimulant once or twice in the day, but it should never be wholly or chiefly trusted to. If the bowels are not very irritable a small quantity of a light cornflour pudding may be cautiously given twice a day, but the existence of much diarrhœa will prohibit this as well as broth. Every two hours at least, except that the child should never be wakened from a sound sleep, simple food must be given in small quantities, in the face of all objections on its part, and irrespectively of the trouble it will certainly entail to the nurse. Peptonised milk may prove of great value after the first week or ten days, especially if curd appear in the stools, a condition which will be accompanied with flatulence, restlessness and increased fever ; or the addition of sodawater may be made to the milk. When there is exhaustion sufficient to render the administration of food difficult, it is a good plan to employ at intervals an injection of a small wineglassful of peptonised milk, to which may be added a teaspoonful of essence of meat. Of course such an enema is to be retained, an object which is easily effected by pressure with a folded towel for a few minutes after the pipe has been withdrawn. Cold water may be liberally allowed, but in small quantities at a time. Barley water will allay the thirst more effectually.

Nutrient enema.

Ventilation and disinfection.

The ventilation of the room should be thorough ; all evacuations from the bowels, stomach and bladder are infective and should be received on napkins or folded

sheets, and such soiled linen should be immediately plunged into disinfecting fluid and removed from the house. Heavy bed-coverings are to be avoided, the room should be kept still, and every effort made to encourage sleep and tranquillity.

Bed sores.

The child's back and buttocks should be daily examined for any red or angry-looking patches, indicating the threatening of bed sores, which should be guarded against by the use of soft pillows or air cushions; and by painting the inflamed parts with white of egg beaten up with spirits of wine.

Sleep.

To secure sleep, the warm bath (98°) and subsequently anointing the body with oil, will be found very useful. Medicines, as will be explained, may also be needed for this purpose.

Stimulants.

Towards the end of the second week it will frequently be desirable to employ wine or brandy, in quantities proportionate to age; a teaspoonful of the latter three or four times a day, with four or five times its bulk of water, may be required by a child three or four years old. But should the symptoms become very severe, with great exhaustion, clammy perspiration, prostration, and diarrhœa, the quantity of spirits should be considerably increased, according to the effect produced. Weak tea and milk as a preventer of waste may be given in moderation if the child will take it. When there is much exhaustion the food should not be given altogether cold.

Rest.

The child should be spared every possible exertion. Night and day his every want should be instantly attended to. As far as possible, all his whims should be humoured. The nervousness consequent upon excitement is quite capable of greatly aggravating the symptoms.

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Medical remedies.

Throughout the whole course of this affection no opening medicine of any kind should be given. With a very moderate diarrhœa we need not interfere, because if we lock up the unnatural excretion it will readily decompose in the intestine, and produce further irritation or inflammation. On the other hand, we should never, if we can prevent it, allow anything like sharp or constant purging. The number of the motions will, to some extent, guide us; two or three in the twenty-four hours may be permitted, but their nature is a surer pilot. A very watery purging should be checked by astringents and aromatics. Scanty slimy motions will seldom benefit by the administration of astringents, but an occasional enema of tepid water will greatly relieve the condition. Aromatics will prove useful by relieving flatulency and distention; but chiefly to a careful diet must we trust to regulate the bowels generally. Poulticing the abdomen often proves very beneficial under these latter circumstances. Should the symptom (diarrhœa) persist, the addition of a drop or two of laudanum (*see* enemata) to one of the injections, which should be small with the intention of its being retained for a time, may judiciously be made.

Avoid purgatives.

Check diarrhœa.

Bleeding from bowel.

Should there be bleeding from the bowel, the utmost quietness must be observed; the patient should never be moved or raised into the erect position, and prescription No. 31 should be given in conjunction with No. 30 till the symptom has ceased.

Spongings.

Cold or tepid spongings of the surface will be of essential service by reducing the temperature and imparting a sense of comfort. A little Eau de Cologne may be added to the water with advantage.

Fomentations.

Distention of the abdomen and pain on pressure should always be treated by fomentations and light poulticing.

At the outset of the disease a fever mixture may with advantage be given, but it need not be continued long, and only used subsequently during periods when the heat is high. Fever mixture.

When depression sets in, after the tenth or twelfth day, a gentle stimulant mixture will be found very useful in conjunction with wine or brandy. But alcohol may be necessary before this period if there be tremor of the limbs and a weak pulse. It should, however, be omitted as soon as these subside, lest it produce depression, reserving it for future necessity. Stimulants.

Delirium and inability to sleep, if not overcome by the spongings, will frequently yield to a dose of Bromide. cmoral, half a grain of Dover's powder or opium (a single drop of laudanum for every year of age completed. *Never more* in twenty-four hours.) Delirium met by sedatives.

As the fever subsides, the stimulants and nutriment ought to be increased, but very cautiously. Solid food should not be allowed for a week or ten days after all active symptoms have disappeared. Meat is not to be ventured upon for at least six weeks after complete recovery. Great caution as to food after recovery.

During convalescence, quinine in tonic doses will be found useful. Chest attacks are not infrequent after typhoid fever, unless precautions against cold be taken.

From the beginning to the end of the disease the measures for disinfection and the precautions laid down should be carried out. Disinfection.

Relapse is common in typhoid fever, usually occurring about ten days after recovery from the primary attack, and more than one relapse may happen. Relapses.

The reader has been already referred to the chapter on "Fever" for the principles which should guide him in treating this disease, and those remarks are now supplemented for the sake of impressing the mind

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Sir Wm. Broadbent quoted.

more forcibly by the following words of Sir William Broadbent:—"The great source of danger in typhoid fever is the prolonged high temperature ..... to keep down, therefore, the febrile heat of the body is to diminish very greatly the danger attending this disease." He then points out that the *continued* administration of drugs of the antifebrin class is much to be deprecated, and that "the most trustworthy means of controlling the temperature is cold bathing." He adds:—

"Without going so far as to say that the cold bath should be employed in all cases, the writer is of opinion that many lives would be saved were cold-bathing at once put in practice whenever a temperature of 103·5° or 104° F. in the first few days show that the attack is of more than average severity; and it is of the greatest importance that this should be done early, so that the pyrexia may never get the upper hand, and that the intestinal lesions may, if such a thing is possible, be modified. And no patient should be deprived of the chance which is afforded by the bath when at any stage of the disease life is threatened by hyperpyrexia or by consequences of high temperature such as violent excitement, sleeplessness, restlessness, or nervous prostration."

CHAPTER XVIII.

GROUP I—*continued.*

DIPHTHERIA.

Definition.

THIS formidable disease is characterised by inflammation of, and exudation upon, the back of the mouth and throat. The whole constitution suffers under great prostration; and after recovery, paralysis or other nervous phenomena are not uncommon.

Infectiousness.

It is highly contagious, and usually prevails epidemically. A child cannot be deemed altogether free from infection till a month has elapsed since complete recovery. After exposure to infection, the disease may commence within thirty-six hours or even less, but more usually two or six days elapse. A week's freedom from symptoms, after exposure, may be regarded as evidence that infection has not been incurred.

Incubation.

Modes of spreading.

Diphtheria is usually disseminated through direct infection. The germs are given off chiefly from the throat with the expectoration, but in severe cases the membrane lining the intestine also becomes affected. Hence the affection may be spread, through the influence of gas from privies into which the excreta have been thrown, if they have not previously been disinfected or possibly, though certainly seldom, through the air in the immediate vicinity of the patient, or by his foul linen; as well as by direct implantation, such as may occur in the act of kissing, or by transferring a feeding-bottle from an infected to a healthy child. Direct implantation is certainly the

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most potent and probably the most frequent mode of infection.

Milk which has been kept in a house infected with diphtheria is another common mode of spreading the disease. But there is no evidence that it is conveyed by water.

There is clear evidence that some of the domestic animals (especially cats and pigeons) are agents through which the disease may be spread.

The infection is portable. A visitor may convey it from house to house in soiled clothing, a condition in which the germs remain long active. Cold and damp and the massing together of children in schools are exciting causes.

Is preventable.

It will thus be seen that, although the modes of dissemination are numerous and subtle, they are all capable of being controlled by isolation and disinfection ; or they are easily avoided. Attendants should wash their hands and be careful not to allow any particles of ejected matter to adhere to clothes or linen. All such soiled materials should be at once removed and disinfected.

Symptoms. Great depression always.

Even though the disease occur in its mildest form, there is always much constitutional depression, as the result of the blood-poisoning upon the nervous system.

Premonitory.

For one or two days there is fever, lassitude, and pains in the limbs, but these symptoms need not

Throat.

necessarily be severe. Some soreness of throat is now noticed ; the glands at the angle of the jaw are tender and swollen. The tonsils and all the back of the mouth are seen to be very red and livid, with here and there small patches of white lymph upon them. Soon all these parts become covered with a film of greyish-white substance ; there is difficulty of breath-

Tongue.

ing ; the glands of the neck enlarge ; the tongue is

red at its tip and foul behind. The temperature may rise to 104° or 105° by the second day, but more usually 101° or 102° is then the reading of the thermometer. It may indeed be stated that anything over 103° indicates approaching danger, as also does great enlargement of the glands. The breath is very offensive. There is difficulty of swallowing, and the patient suffers from a constant "hawking," caused by the endeavours to get rid of the tenacious secretion. The white substance becomes greyish, dense and shreddy ; perhaps separating in places and showing a raw, ulcerated surface beneath. There may be a good deal of nasal discharge. The urine contains albumen in the majority of cases, making its appearance about the third or fourth day. The general prostration is intense. At this point, either recovery begins or the child sinks. If the former, the false membrane separates, the raw surface heals, and convalescence commences. If the latter, the difficulty of breathing increases : should the membrane become detached, another rapidly forms, stupor from blood-poisoning comes on, and death ensues. Sometimes, though happily rarely, sudden death occurs from failure of the heart, without any warning symptoms.

Temperature.

False membrane.

Signs of recovery and of death.

Diphtheria is always a dangerous affection. Scanty urine, difficult breathing, and extreme prostration are bad signs. It is said that the occurrence of a thick nasal discharge is a favourable sign as indicating commencing resolution. A rise of temperature after the fifth day is ominous. Diarrhœa during the latter stages indicates danger. The younger the patient, the greater the danger.

Prospects.

Diphtheria cannot well be mistaken for croup ; the absence of paroxysms of difficult breathing, and the condition of the throat as actually seen, are sufficiently distinctive.

Distinction.

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For scarlatina it might be mistaken in its very early stages, but the absence of rash after the second day, and the throat incrustation, will be evidence enough.

Treatment.

Cold locally.

The child should be put to bed in a large, well-ventilated room. And as soon as possible the doctor will no doubt inject Diphtheria Antitoxic Serum.

Further objects.

The treatment has three objects in view—(1) to support the patient's strength, (2) to relieve the throat, and (3) to prevent blood-poisoning.

The most concentrated nourishment from the beginning.

From the very commencement concentrated nourishment must be given ; the strongest jugged beef soup, Brand's essence of meat, Johnson's fluid beef, peptonised foods, eggs beaten up with milk, and occasionally egg and brandy should be sedulously given at short intervals. Stimulants are essential from the beginning, and they are to be given with guarded liberality. Without such feeding and stimulation no treatment can avail. If there is difficulty in accomplishing the administration of nutrition by the mouth, the substances named should be injected into the bowel, an ounce at a time, and retained there by gentle pressure.

Avoid purgatives.

Unless there is actual constipation, it is better not to trouble the child with purgatives.

Position of patient.

When the pulse shows signs of failing, the patient should be kept very quiet in bed, with his head low, and he should never be allowed to assume the erect posture while this state lasts, lest fainting, which might easily prove fatal, be induced.

Moist and heated air.

When the breathing is becoming impeded, or when the false membrane is seen to become dense and thick, the directions as to placing the patient under a blanket tent, which is supplied with moist and heated air, should be observed. The object now is to cause the membrane, by the aid of heat, to detach itself, but the patient may still be allowed to suck ice. With this

object, inhalations of steam frequently repeated, and the application of a warm, moist sponge externally, are likely to prove beneficial. To each pint of the hot water, used for the inhalations, it is desirable to add twenty drops of carbolic acid.

Should the membrane begin to separate, these measures must be persevered in with increasing assiduity; but anything like a stewing process in a confined humid space would be dangerously depressing.

Medicines and applications.

As to medicinal agents, so soon as any signs of the film or exudation become noticeable on the throat or tonsils, these parts should be thoroughly swabbed over with an antiseptic application; and the following mixture should be prepared with accuracy in the manner below described:

Take of chlorate of potash, 30 grains; strong hydrochloric acid, half a drachm; quinine, 12 grains; tincture of steel, 40 minims; syrup and water sufficient to complete up to 10 ounces.

Place the potash in a ten-ounce empty bottle; pour upon it the strong acid, and cork the bottle *loosely*. or cover it *lightly*. When the bottle is full of gas, as it will be in a few minutes, add the water little by little, shaking the bottle each time. Finally add the syrup, quinine, and steel.

N. B.—Should hydrochloric acid not be available, the mixture may be prepared by substituting three times the quantity of tincture of steel here ordered, and using two-thirds of it as though it were the acid.

Of this mixture give two teaspoonfuls every fourth hour to a child five years of age; but when the difficulty of swallowing becomes very great, it is wiser to omit internal remedies altogether than to exhaust the child with attempts to administer them. There will be exhaustion enough in the endeavours to swallow food.

Importance of local treatment.

But we must ever recollect that diphtheria is a disease of local origin. The germs secure a lodgment in the throat, where they undergo incubation, and their

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products are diffused throughout the system as a blood poison. The most recent investigations favour this view, which points to the immense importance of local treatment with the object of killing the germs and thus cutting off the supply of poison which they are continually manufacturing and diffusing throughout the body. But these germs invade every nook and corner, and reside in the deeper layers of the mucous membrane; hence it is no easy matter to attack them effectively, and thus is accounted for the numerous failures of local treatment, which, if it is to be anything but a fiction, must be carried out masterfully and thoroughly without an excessive sympathy for the annoyance and fatigue it may occasion the child.

Nature of local applications. Boracic acid.

Of what is this local treatment to consist? Certainly not of caustics, but of antiseptic agents. Of these, *boracic acid is the safest* and most innocent to place in the hands of an untrained nurse, but the *bichloride of mercury (corrosive sublimate) is the most efficient.*

Corrosive sublimate.

The former (boracic acid) is best prepared by making a saturated solution with glycerine, and this is to be applied every hour, in the most thorough manner, by means of a camel's hair brush. The latter (corrosive sublimate) is to be dissolved in water in the proportion of 2 grains to each ounce,* and it is to be similarly applied every second hour. (*Read the note.*) Should either of these drugs not be at hand, there is another of a perfectly innocent nature, which is deserving of attention, namely, common powdered *sulphur*, which is always procurable. It should be dusted over the parts

Sulphur.

* This is a strong solution, and a serious remedy to place in non-professional hands, but of its efficiency the writer is so convinced that he mentions it in view of the terrible emergency with which parents sometimes find themselves face to face, in isolated regions. The greatest caution is necessary in handling it.

with a dry brush every hour. The decomposition of the sulphur caused by the exudation acts as a germ slayer. At the same time the sulphur in the proportion of ½ an ounce to a pint of water or rose water may be used as a gargle if the child be old enough. If a scent spray bottle be at hand, *carbolic acid* solution (one drachm to ten ounces of rose water) will make a good *spray*, which may be diffused down the throat at intervals between the applications. CHAP. XVIII. Carbolic spray.

The following solution has been very highly recommended and successfully used as a spray :—

℞

Tinc. Iodine	...	... m. xl
Acidi Carbolici	...	... ℥ ii. to 3 iv
Spt. Vin. Rect.	...	... ℥ ss
Glycerin	...	... ℥ iv
Aqua ad	...	... ℥ viii

But the best results have been obtained with chlorine, formalin ½ per cent., chinosol ⅙ per cent. or sulphurous acid used by syringing or spraying.

To sum up : the corrosive sublimate solution is the most efficient, but it is a dangerous remedy to compound and handle, and one not lightly to be used by untrained persons. The boracic acid is next in order of efficiency, and it is perfectly safe. Sulphur is a remedy possessing undoubted valuable properties, and as it is always at hand, it is a good stand-by. Carbolic acid is excellent, but in solutions sufficiently strong to be relied upon, alone it would not be suitable. A very much stronger spray than that recommended here is, however, often used. The weaker spray is very agreeable, and is certainly calculated to help one of the applications. In all cases when the disease has advanced, the nostrils should be syringed out several times a day with Condy's fluid solution. Or Bicarb. Soda 20 grs. to 1 oz. water. Summary. The nostrils.

CHAP. XVIII.

By proceeding in this way the remedies are brought into actual contact with the parts at short intervals; and the medicine is rapidly introduced into the blood.

Should the case continue to advance unsatisfactorily, the respiration becoming seriously impeded, the condition demands the performance of an operation to save the child's life. Should a surgeon propose to do so, the mother ought not to oppose his advice. A mother's not unnatural plea for a little more delay may remove even this chance of escape.

The debility of convalescence.

The weakness of convalescence is best met with tincture of steel and cod liver oil administered together internally, and by change of air. A sea trip, when possible, is always advisable.

Paralysis as a complication.

Diphtheria not infrequently is followed by paralysis —generally partial—involving various parts of the body. Generally this condition is recovered from, being amenable to treatment by steel, quinine, fresh air, and good food. The muscles of the palate are usually the first to be thus affected; the voice then assumes a nasal, drawling, monotonous character; fluids pass through the nose when attempts are made to drink, and the child experiences great difficulty in expectorating. The eyes are, next in order of frequency, affected; confusion of sight and giddiness being the chief symptoms. If the legs become affected, a trembling and uncertain gait soon discloses the fact.

The amount of paralysis which may succeed a case bears no proportion to the severity of the primary disease.

This complication may last from six weeks to a year; but, as stated, the natural tendency is towards recovery after two or three weeks.

In some cases of diphtheritic paralysis the danger of death by starvation is great, as the child cannot swallow any food, all being returned through the nostrils. Then the only hope is to feed the child through the nostril by means of a soft tube passed into the gullet and a syringe or funnel. To accomplish this satisfactorily and without danger is very easy, if the parent has been shown how to do it by a skilled person. Alimentation.

As a complication of measles, diphtheritic state of the throat may occur, sometimes simultaneously with the measles itself, more frequently as recovery from the latter is taking place. It is also predisposed to scarlatina and typhoid fever. In such cases the affection should be treated in all respects as though it were a case of pure diphtheria. Diphtheria complicating measles.

There is a well-established treatment mentioned above for diphtheria which should always be adopted when possible. It is known as the antitoxin treatment. The remedy is prepared and standardised by specially trained experts. A proper dose is subcutaneously injected. There is no attendant risk, and if used early, the results are found to compare favourably with those attained by ordinary treatment—indeed, if resorted to at the earliest stage, the mortality is very small. Of course, this plan can only be carried out by a medical man who is in a position to obtain the antitoxin. Children and others exposed to infection and living in the same house should also receive an injection of the antitoxic serum to protect them from this disease. Antitoxin.

INFLUENZA

Is an infectious epidemic illness with an acute onset, marked febrile symptoms, and usually by catarrh, and a tendency to serious complications, followed by prolonged prostration. Relapses are common. The Nature and symptoms.

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fever usually lasts three or four days, but sometimes longer.

The peculiarities of the cases are, the suddenness of commencement with a feeling of chilliness, the great and unaccountable prostration, and the occurrence of very distinct pain somewhere, either as headache, pain in the legs, back, or abdomen. Catarrh usually attends the fever. There is also a cough which is not severe, running of the nose and watering of the eyes are common, but in many cases these symptoms are absent. The appetite disappears, vomiting is often present, and diarrhœa is frequently an accompaniment.

Three distinct forms are recognised, *viz.*—(*a*) the catarrhal, which is attended with inflammation of the eyes and a tendency to throat and lung affections; (*b*) the gastric, which sets in with sudden vomiting and diarrhœa; and (*c*) the nervous, marked by severe headache and backache and great depression.

Recovery nearly always takes place, and convalescence is more rapid than in adult cases.

Prospects. Treatment.

Five drops of Ammoniated Tincture of Quinine is a good and useful remedy. One grain of Salicylate of Sodium with two grains of Bicarbonate of Sodium given three times during the day will reduce the fever and relieve the pain. In addition, an ordinary fever mixture and perhaps a mild aperient, are all the medicines that are required. The patient must be strictly confined to bed and given concentrated liquid nourishment. At the commencement of recovery a little wine will serve to lessen the feeling of depression. Afterwards change of air ; and tonics, such as ammonia and bark or quinine, will be found very useful. The patient should not be allowed out of bed for a couple of days after recovery. Complications are to be treated as described under the various headings.

WHOOPING-COUGH.

Nature.

This is an infectious disorder, most common during childhood. A single attack protects the constitution for the rest of life with few exceptions. About eight days is said to be the period of incubation, but probably it is considerably more in many cases; and, according to Squire, six weeks should elapse before the child is permitted to mix with its healthy companions. Isolation should be strictly enforced from the beginning, and especial care should be taken to remove all infants and very young children from the possible influence of the infection, as it is to them that the most serious results of the disease happen.

Importance and frequency.

There is a tendency to ignore whooping-cough as being an unimportant affection; but, as a matter of fact, it is a serious and frequent complaint in India, and one of the most fatal diseases of childhood in England, —only convulsions, diarrhœa, scarlet fever, and inflammation of the lungs preceding it in fatality.

Age of occurrence.

The affection is most common before the age of three; after five it is less frequent, and after ten it is rare. Strange to say girls suffer more from it than boys. Frequently it occurs as an epidemic, and it is spread by contagion.

Symptoms.

Whooping-cough commences as a common cold; with sneezing, running at the nose and eyes, tickling of the throat, and an irritating cough together with slight feverishness. All these symptoms soon abate, except the cough, which becomes intensified, especially at night. Attacks of more or less severe spasmodic coughing succeed in a few days. Each attack consists of fitful spasmodic expirations, after which comes a loud crowing inspiration. During the attack, which may last from half a minute to two or three minutes, the face becomes purplish, and the veins of the head and

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neck swell out. Vomiting will probably succeed, and thereby a quantity of tenacious mucus is ejected. In the intervals between the attacks the child is comparatively well, and he will return to his play. Paroxysms are easily induced by emotions, such as anger, excitement, laughing, crying, or hasty eating or drinking. The vomiting, which will occasionally occur, is purely mechanical, for immediately afterwards the child will ask for more food. From the time the first whoop is heard it may be expected that the child will become worse for about a week, and the whoop will continue probably for from three to six weeks. It may be noted that in very young children the whoop is rather the exception than the rule.

Duration.

Signs of decline.

The decline of the affection is notified by the lessened frequency and severity of the paroxysms. The whooping inspiration disappears, or occurs only seldom; the cough, however, remaining for two or three weeks longer. During the illness the child is pretty sure to become emaciated.

Complications.

The complication most to be dreaded is inflammation of the chest. Convulsions occasionally follow a paroxysm; indeed, the over-distention of the brain with blood may sometimes, though rarely, occasion inflammation of the brain. Bleeding of the nose is not infrequent. Crimson spots of blood effused into the white part of the eye, or the occurrence of a "blackeye," due to the straining, need occasion no alarm, and will soon disappear. Ulceration beneath the tongue, due to scraping against the lower teeth during the paroxysms, is a well-known complication. Collapse of the lung, due to the plugging of one of the air-tubes with tenacious mucus is a most formidable, usually a fatal occurrence.

Prospects.

When free from complications, whooping-cough is seldom fatal. High fever during the first stage is a

warning of subsequent complications. Apathy and listlessness between the attacks, and persistent high fever, are bad signs. Convulsions at any stage are of evil omen. From the number of paroxysms which occur each twenty-four hours an estimate may also be formed of the severity of the complaint ;—twenty indicate a mild, thirty a tolerably severe, and over forty a grave attack of the disease. Lung and head complications are always dangerous.

Treatment.

Whooping-cough is one of those affections which will run its course. We know of no remedy which will cut short the disease, therefore our business is to guide the patient safely through it. In treating the affection we must recollect that we are not dealing with an inflammatory disease, but with a nervous complaint, which expresses itself spasmodically.

First stage.

During the *first* stage (primary catarrhal stage) or that of ordinary cough and cold, which lasts eight or ten days, the fever mixture will be useful ; and, in addition, the ordinary precautions as to non-exposure, attention to the bowels and warmth of clothing, which will suggest themselves, are to be adopted ; but above all plenty of fresh air and air-space are needed. Goodhart and Still have lately tried antipyrin, and found that *in some cases* it has acted beneficially in a very definite manner ; and they have also found it useful to blow a little Boracic powder or powdered Benzoin, often a little dilute Nitric Acid proves useful, from a quill up the nostrils three or four times a day. From the commencement the diet should be nourishing, though simple. It is a good plan to give food just after the paroxysm.

Second stage.

During the *second* stage, or that of "whooping," we rely upon anti-spasmodic medicines to relieve the

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paroxysms; we endeavour to check the excessive secretion of mucus, to allay throat irritation, to keep the air-tubes as free as possible, and to support the patient's strength. To accomplish these objects the bromide of potassium to which appropriate doses of the paragoric elixir have been added, should be given when the paroxysms are severe, aided by one or two doses of the chloral mixture daily. Alum, three grains in a little water every fourth hour, will act similarly, and it has the additional advantage of checking the secretion of phlegm. Very frequently it will be found a good plan to alternate these medicines, the one with the other, every few days, if continuous aid be necessary. Belladonna is a medicine which has been greatly praised for these cases. Children certainly bear this drug well, but the doses recommended are beyond non-professional responsibilities. Three or four drops of the tincture may, however, safely be given to a child of three with each dose of one of the other remedies. The application of the glycerine of tannic acid to the throat will be found useful in suppressing secretion and allaying irritation. The inhalation of carbolic acid vapour (20 drops to a pint of hot water) is decidedly useful or spraying the throat with a two-per-cent. solution of Salicylic Acid effects the same purpose. Should mucus accumulate sufficiently to impede respiration, an emetic of ipecacuanha wine is to be employed. Attacks of difficulty of breathing at night will be relieved by the hot bath and mustard poultices to the top of the chest. Each day the chest and spine should be sponged with cold water, and afterwards rubbed with the turpentine and camphor liniment. Should there be wheezing between the paroxysms, a stimulating expectorant may be used with advantage.

Gentle exercise in the open air, if the weather is sufficiently fine to admit of it, is not only allowable but highly desirable. If this be not possible, the child should be changed from room to room several times a day. Outdoor exercise.

In every possible way, causes of mental excitement should be avoided. Avoid excitement.

During the *third* stage, or that of abatement, when we find subsiding spasm and loose expectoration, the emaciation and debility are best met by the employment of cod liver oil and iodide of iron. Alum is now particularly useful. Third stage.

Should a complication arise, whatever be its nature, be careful to abstain from anything like a lowering system of treatment or diet. Complications.

As in measles, but less frequently, whooping-cough is sometimes succeeded by a chronic state of bad health. Any fault inherent in the system is then likely to be developed. Such patients are especially liable to a form of indigestion characterised by occasional bilious attacks, when a quantity of slime is purged and vomited, and the child becomes pale and thin, and suffers from night terrors. Then for a time farinaceous and fermentable foods should be stopped, including sweets and most kinds of fruits. By this means, and the occasional use of a mild purgative, a cure will be effected ; frequent vomiting being treated by an emetic. After-consequences.

CEREBRO-SPINAL FEVER.

This is a fever of a very distinct type and formidable nature. It does not appear to be contagious although it usually occurs in epidemic form. Its chief characteristics are the suddenness of attack, the slightness of the fever, irregular at the onset—becoming normal, then rising again—may at times be remittent, and the Symptoms.

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expenditure of all its force upon the nervous system. There are seldom any premonitory symptoms in the child. Possibly he may have gone to bed comparatively well and then got a convulsion ; or there may have been some vomiting, torpor, and complaint of pain in the back of the head and neck, previously. Insensibility or delirium rapidly succeeds, the head is drawn back and is more or less stiff in that position, the pupils are contracted at first, and the limbs may after a time become more or less rigid and drawn up ; when the thigh is flexed on the abdomen, the leg cannot be extended because of the spasms of the muscles of the thigh is said to be a very diagnostic symptom in this disease (Kernig's sign). The breathing is sighing and irregular. When the temperature is taken, it will be found to be only about 101° or 102°, if so much, but as time passes, it will rise. In some cases, indeed, there is almost no fever. A prominent feature is the presence of some skin affection very often occurring symmetrically. On the second day a rash of purpuric spots commonly appears on the neck and limbs. Herpetic eruptions are common. About the third day a blotchy eruption is often noticed on the body. The danger is that the insensibility may increase and the child pass into collapse.

Duration.

The disease observes no special duration. The prospect of recovery is not hopeful in infants. A mild case may terminate favourably in one or two weeks. A severe case may end fatally very rapidly, and cases of medium severity may last from two to four weeks. The first three or four days are the most dangerous.

Treatment.

The cardinal points appear to me to be (1) to push sedatives, and (2) to nourish and stimulate from the commencement, while (3) the attention is not to be diverted from the temperature, which should be kept in

check by cold baths and the other means enumerated and (4) the bowels are to be relaxed from the beginning to the end.

The combination of chloral and bromide of potassium is the best sedative to use. Trional or sulphonal may be tried, and if found sufficient to subdue the nervous irritation, ought to prove valuable, as neither depresses the heart's action ; but if pain be the cause of the nervous symptoms and sleeplessness, it will be necessary to rely upon opium in the first instance (*see* Opium). It is a matter of vital importance that the nervous irritation be thus completely controlled. The brandy and egg mixture will form an excellent stimulant, unless the child be very young, when white wine whey may be substituted. A stimulating enema is a good commencement of treatment, and it may even be allowable to apply diluted mustard plasters to the back of the neck and other parts of the body till reaction is initiated. Peptonised milk forms an excellent food, but strong meat essences and the juice of raw meat must also be employed, as well as such light and digestible articles, suitable to age, as the child can be induced to swallow. As a purgative, prescription 56 will answer. The freest ventilation, a cool atmosphere, a darkened room, and perfect quietness are other essentials of treatment.

It has lately been demonstrated that this disease is due to a specific micro-organism (*Diplococcus intracellularis*).

CHAPTER XIX.

GROUP I—*continued.*

MUMPS.

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Nature.

MUMPS is an acute febrile infectious disease which affects children and young adults at any season of the year. The affection is an inflammation of those glands which secrete the saliva, the largest of which are situated one at either side of the face just beneath the ears. The swelling produces a peculiar rounded look about the face, in front of the ears and under the chin. A child remains capable of propagating the affection for two or perhaps even three weeks after the disappearance of the disease. The patient is most infectious during the earlier days of the illness, and then infection diminishes gradually. A susceptible person first seen ten days after exposure to infection may be quarantined with every prospect of preventing spreading. The infection is not easily conveyed even in short distances.

Cause.

Mumps seldom attacks the same person twice. It is spread only by infection, after exposure to which perhaps a fortnight will elapse before symptoms appear.

Symptoms.

A feverish cold and stiffness of the jaw are the earliest observed symptoms. Then appears a painful hard swelling in the neighbourhood of the cheeks and ears, extending beneath the chin. The child is unable to open its mouth. Any motion of the jaw and swallowing is painful, the face is distorted. The fever and swelling increasing, reach their maxima on about the

third or fourth day, from which time all symptoms gradually diminish, till complete recovery is attained by about the eighth or tenth day.

The swelling may occur on one side only, run its regular course, and then be succeeded by the same appearance and symptoms on the other side ; or both sides may be affected simultaneously.

Migration of inflammation.

Sometimes a hardness and some small amount of enlargement remain for a considerable time after recovery.

Treatment.

A singular fact about mumps is the possibility of the inflammation leaving the salivary glands, and transferring itself, to the testicle of a boy or breast of a girl.

Rest in bed, a brisk purgative, fomentations, and perhaps a few doses of fever mixture, together with restriction to a light diet, is all the treatment that is essential during the febrile stage. Subsequently painting the hard swellings with iodine, or rubbing in the iodine ointment and a short course of tonics will complete the cure.

The patient should not be allowed to mix with other children or go to school for about 4 weeks and should be isolated as far as possible.

CHAPTER XX.

GROUP I—*continued.*

RHEUMATIC FEVER.

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Symptoms and course.

THIS disease commences rather suddenly, with a feeling of coldness, sorethroat, and flying pains in the joints; and there is thirst, feverishness, and loss of appetite. The temperature will be found 102° or 103°. Pain is experienced in some of the middle-sized joints—the knee, ankle, wrist, or elbow, for instance—and it shifts from one joint to another. All these symptoms become aggravated, and with the fever there is a copious sour-smelling perspiration. The temperature runs up to 104° or 105°, or even higher, in proportion to the severity of the joint-affection; the joints swell and become very tender to the touch. Sleep is almost impossible. Delirium is uncommon, but the face is anxious. A case may last for some weeks, but in children it runs a more rapid course than in adults. The acute symptoms may be much prolonged by neglect. Relapses are common.

In children the disease often runs a *latent* course, that is, the symptoms may be so slight as scarcely to attract attention—feverishness or "growing" pains alone are recognised, yet the case may be one of genuine rheumatic fever, with liability to all its complications.

Small firm lumps (rheumatic nodules) can be seen or felt in about 10 per cent. of the cases in children under puberty. Their most common seats are over

the elbows, ankles, and knees. They last a few days.

Seriousness.

Rheumatic fever is not so serious in itself as in the after-mischief which is so frequently entailed by heart disease, of which it is the commonest cause. The immediate prospect is favourable, but a child who has once suffered is particularly liable to a second attack ; and the younger the patient, the more will the joints be spared and the heart attacked.

It requires skill to detect the fact of the heart having been attacked ; for usually there is neither pain, tenderness, nor other prominent symptom ; but almost always the child then bears an appearance of distress which cannot be otherwise accounted for. Accompanying this disease, heart affections are more common in childhood than when rheumatic fever first appears in the adult. The joint-affection may be slight, but the heart is just as liable to attack as in severe cases. Inheritance and previous attacks conduce to liability to the disease.

Other complications.

In addition to heart affections, children who suffer from this disease are liable to subsequent attacks of tonsillitis and certain skin affections, as well as to the distressing condition known as chorea, or St. Vitus's dance.

Treatment.

This is one of those diseases in which good nursing is invaluable. The nurse should be strong enough to lift the patient with facility ; and the patient, clothed in a long flannel night-gown cut down the front and furnished with strings, should lie upon a narrow bed, well padded with blankets beneath, and he should be covered with a blanket or blankets, according to the season, without the intervention of sheets. Perfect rest and absolute confinement to bed are essential. The affected joints having been sponged

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with warm water, in which Carbonate of Soda has been liberally dissolved, should be wrapped in cotton-wool and supported by pillows in comfortable positions. Small doses of opium should be given to relieve pain (*see* Opium). Now we have to endeavour to counteract the poison in the blood, which is occasioning the joint inflammations and endangering the heart. To do this we open the bowels gently, and then begin to administer the Salicylate of Soda in doses of six grains every third or fourth hour to a child of five years, while stimulants are given in moderation and the dose of the Salicylate lessened as soon as any depression is observed.

The Salicylate should always be combined with at least double the dose of Bicarbonate of Sodium to prevent any dangerous toxic effect to which some children seem more liable than others.

In this way the urgency of the symptoms will soon be mitigated, but it is better in any case not to continue this drug for more than a couple or three days, as it is depressing. We may then substitute the Bicarbonate of Soda in similar doses.

Asperin in three to five grain doses may be given three times daily to a child of six years of age. Salicin is equally effective in these cases.

When the disease has been subdued, a steel and quinine tonic should be given to combat the anæmia which is so frequently present. Pain is to be relieved by Dover's powder or laudanum in appropriate doses.

Three to four grains of the powder may be given to a child of six or eight years old. The diet should consist of milk and some farinaceous food and not till convalescence has set in should meat be allowed, nor should there be any hurry in

permitting the patient to rise from bed, the danger of a relapse during the first week being considerable.

Frequently as it happens in the adult, an extremely high degree of fever in this disease is fortunately rare with children, and when it does occur, the means for subduing bodily heat already recommended (*see* Fever) are to be put into practice without hesitation. Upon this point all authorities are agreed. The after-treatment consists in change to a dry climate, and the prolonged administration of arsenic, cod liver oil, maltine and iron. Three to five drops of Liquor Sodium Arseniate with half a teaspoonful of Easton's Syrup taken for a month or six weeks is a most valuable help in these cases.

KALA-AZAR.

This is a long-continued, irregularly remittent fever of no definite type, lasting frequently for many months with or without remission. It was previously known as "Malarial Cachexia," but recent investigations have proved it to be an entirely different complaint due to a different parasite. Great muscular wasting combined with excessive enlargement of the spleen and to a less extent of the liver, constitute the striking phenomena of the disease.

The skin presents a peculiar dusky or earthy colour from which the name of the disease (Black Fever) is derived. The parasite is most abundant in the spleen, bone marrow, liver, but, unlike the Malarial parasite, is not found in the circulating blood.

It is prevalent in Assam and Bengal and the mortality is generally very high. It is thought probable that this disease is conveyed from one person to another by bed bugs, as it is also probably the way in which leprosy is spread.

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Treatment.—We do not know much about the treatment of this disease yet, it is not cured by quinine as Malaria. Certain forms of Arsenic, administered by injection under the skin, have been reported to be beneficial. Feeding the patient to keep up the strength and a change of climate are measures that should be always adopted.

MALTA FEVER.

Malta fever is a disease which as yet has not appeared very frequently in India. But in that it gives rise to a prolonged febrile attack which is very puzzling from the point of view of both diagnosis and prognosis, it is well that we should briefly consider it.

The name Malta Fever is not a good one, for it has been definitely proved that it occurs in India, Africa and China, besides on the shores of the Mediterranean. It was due to the researches of Sir David Bruce that the organism that causes the disease was isolated. He proved what again and again has been amply verified that the main source of the disease is milk, and more particularly goat's milk, though it is also certain that the germ may be conveyed by inoculation.

The symptoms of the disease are not unlike those of typhoid fever. There is headache and perhaps delirium, a remittent temperature, and slight enlargement and tenderness of the liver and spleen. Perhaps some catarrh of the lung and stomach. But the most marked features of the disease are rheumatic-like pains in the joints and a tendency for the fever to disappear after weeks or months and then return. The disease is rarely fatal.

Treatment is to a large extent preventive, that is, water and food should receive attention and all milk be sterilised by boiling.

The disease differs only slightly from typhoid fever (the main points being the absence of spots, and the presence of pains and tendency to long relapses).

Therefore in any such continued fever, the treatment should be along the lines laid down for that disease, until such time as a competent medical opinion can be obtained on a Widal tube of the patient's blood.

CHAPTER XXI.

GROUP II.—THE ERUPTIVE FEVERS.

MEASLES.

CHAP. XXI.

Definition.

THIS is an infectious continued fever, accompanied by a copious characteristic eruption and catarrh of the respiratory passages. Infection, according to Squire, begins with the commencement of a case and lasts for about three weeks.

The disease is spread only by infection from person to person, either directly or through the medium of a third person. When the skin is scaling off is the time of greatest capacity for spreading the complaint. The occurrence of this illness usually protects from a second attack. A period of from seven to fourteen days elapses from the time of exposure to infection till the disease commences.

Symptoms.

A sense of chilliness, with headache, thirst, and a foul tongue, drowsiness and feverishness are the earliest signs which show themselves. At the same time the child seems to be suffering from a cold in the head ; he sneezes, his eyes are watery, there is usually some cough, and the eyelids are puffy. The feverishness and general symptoms increase. On the fourth day of their continuance, the rash makes its appearance, first on the forehead and face, from which it gradually extends over the whole body.* This rash is

* What is known as " Koplik's symptom " is often observed some three or four days prior to the eruption, but it is by no means constant, and is therefore not reliable as a means of diagnosis. It consists of minute grey specks slightly raised on the inside of the mouth near the back teeth and on the inner side of the lower lip.

of a dull brick-red colour, consisting of innumerable small fleabite-like spots, slightly elevated above the surface.

The fever, now perhaps 104°, does not diminish with the appearance of the rash; it may, indeed, increase, but the cold and cough either wholly vanish, or become greatly lessened at this period.

Duration of the rash.

The rash, often arranged in crescentic patches, lasts for three days before it begins to fade, and with its decline the fever and other symptoms subside gradually, till on the ninth day of the illness they have all disappeared, leaving behind only redness and scaling of the skin. Sometimes itching of the skin is almost intolerable, either when the eruption is at its height or when the scaling commences. Occasionally the glands of the neck become greatly enlarged in the early stage of the illness, and then there is usually a good deal of sorethroat—the latter being most common when the eruption is fading.

In India, measles rarely assumes a malignant type. Should the eruption be copious and of a purple colour, should the tongue become dark and brown, the prostration great, and the chest symptoms severe, the disease has assumed a very grave form.

Bad signs.

Sudden disappearance of the eruption is a sign of significance, generally indicative of bronchitis or other lung complaint. So, a continuance of the high temperature after the rash has, in due course, disappeared, is unfavourable.

Measles is easily distinguished from other complaints by the character of the eruption and the time of its appearance. Distinct elevated red papules appear on the fourth day, whereas the eruption of scarlatina is a uniformly diffused red blush, appearing on the second day, and the more distinct elevations of small-pox

CHAP. XXI.

appear on the third day. Unlike small-pox, the fever does not subside with the appearance of the eruption. The watery eyes, sneezing, cough, swelled face are very characteristic of measles as early symptoms.

In India the prospects are believed to be decidedly favourable, though the affection is common enough; but figures prove that the disease in this country is not one to be ignored, a considerable fatality sometimes happening. The severest mortality occurs between one and three years of age.

Treatment.

From the earliest moment, the child should be confined to bed in a room properly ventilated, but free from draughts. In the cold weather it will be advisable to light a fire in the room to preserve the temperature at about 65°. It is very important to guard against cold, but a higher temperature should be avoided, lest we add to the bodily fever-heat. The fever mixture (36) will soothe the cough and promote the action of the skin. Quinine is sometimes useful in lowering the temperature. It may be given in 1 or 2 grs. doses according to the age of the child two or three times daily. The inhalation of steam from over a jug is grateful, and lessens coughing. The fever drink (63) may with advantage be allowed. Sponging the surface piecemeal with vinegar and water allays the irritation of the skin, and generally exercises a soothing influence. "The free use of cold water, so speedy and potent an antipyretic in scarlet and other fevers, is not required in the early stages of measles, and would be injurious until after eruption is out; where this is interrupted, as by debility or chill, sometimes by convulsions in the infant, the warm bath is to be used, with or without the addition of mustard" (Squire). Cold affusions may be necessary to subdue the fever at a later stage, when, if head-symptoms threaten, ice

should be applied to the head. From beginning to end a starvation system should be avoided, though the diet should be of a light nature—milk and water and barley water, with any farinaceous food that may be fancied.

Stimulants.

Should the severer symptoms manifest themselves, it will be necessary to resort to stimulants, both in the shape of medicines and wine or brandy; and the greatest attention must be given to the administration of nourishment. "There is, perhaps, no condition where wine and spirits produce such marked and immediate benefit as in the pulmonary congestion at the crisis of measles. They are sometimes the means of saving life in the after depression till such nourishment can be taken as will soon supply the needed support" (Squire).

Chest complications.

Troublesome cough with hurried breathing should be encountered by large poultices to the chest, followed by turpentine stupes. A few drops of Tinct. Camph. co. may be given. It may also be necessary to give an emetic (39) to assist the expulsion of phlegm. The danger of measles "depends almost exclusively upon its complications, and as in their absence there is little to excite alarm, so there is little to call for treatment" (West). Painting the throat with glycerine and borax (15) often acts very effectually in allaying cough. The child may be allowed to swallow a little glycerine and borax if painting is found difficult to manage. Disinfection should be carried out as recommended on pages 144 and 153.

Complications.

The complications which sometimes accompany or follow measles (though less frequently in India than in England) are—(*a*) Convulsions usually appearing at the commencement of the case, when they are not of such serious import as when they occur later. (*b*) Bronchitis and inflammation of the lungs are the most

dreaded of all complications, but the climate of India is unfavourable to such development. (*c*) Ophthalmia of a painful nature is sometimes very troublesome; but by strict attention to cleanliness, the allowance of a liberal diet with wine and tonics, and the almost hourly use of the ordinary eye lotion (23), a rapid cure will be effected. (*d*) Discharges from the ear are not very common, but when they do occur they are most troublesome. They most usually happen when the disease is disappearing, and are often aggravated by cold. (*e*) Chronic congestion of the throat with a husky voice, and possibly some tendency to diphtheritic symptoms. (*f*) Without the occurrence of any one of these complications, measles sometimes produces a profound impression upon the constitution, which may not become re-established for a long time, varying from a few months to as many years. The most constant indications of this state are a pale, bloodless appearance, duskiness of the skin, flabbiness of the muscles, languor, cessation of the progress of dentition, crossness, and very disturbed nights. Such symptoms should meet with prompt attention, lest disease should insidiously and permanently affect the child's constitution. A life almost wholly in the open air, a generous diet, careful protection from cold, the allowance of wine in moderation, and the administration of cod liver oil and iron (71) are the remedies to adopt.

When a child falls into this state of health, from which he cannot very quickly recover, the temptation to send him to a colder climate may arise. It is not, however, advisable to do so, unless the heat of the place at which he is already resident be so great as to occasion exhaustion, and the climate which it is proposed to adopt be very moderate indeed.

GERMAN MEASLES. CHAP. XXI.

RUBELLA OR ROTHELN.

German measles.

There is an affection termed *German Measles* which, however, is different altogether from and does not protect against true measles. It rarely requires any treatment, but the above rules may be followed. It differs from measles, for which it may readily be mistaken in these respects :—There is a sudden onset without previous sneezing or coughing. The temperature does not rise gradually before the rash appears, nor fall gradually afterwards, as it does in measles. The eruption lasts only two days, commencing on the cheeks, wrists, and ankles, and each point appears distinctly separate. The glands at the back of the neck are enlarged in about half the cases. When this does occur, it is considered a distinguishing characteristic. A mild case in which the fever subsides before the rash has disappeared is probably one of German measles.

Distinction.

CHAPTER XXII.

GROUP II.—ERUPTIVE FEVERS—*(continued)*.

SCARLATINA.

CHAP. XXII.

SCARLATINA and scarlet fever are different names given to the same disease. The former word does not express any minor form of the affection, as is sometimes supposed.

Definition.

Scarlatina is a highly infectious continued fever, accompanied by a general red blush of the skin, and inflammation of the tonsils. The force of the disease is expended upon the throat.

Incubation.

Scarlatina only arises from infection—generally directly from a sick person; but the disease may be conveyed by clothes or in milk. It commences within five days after infection. If more than a week elapses without symptoms, after known exposure, we may reasonably conclude that the child has escaped. One attack usually confers immunity.

Symptoms.

The symptoms vary greatly according to the intensity of the attack. There may be a mere indisposition with the characteristic redness of the skin; or there may be a furious onset, accompanied with delirium, a scanty rash, a dry brown tongue, vomiting and violent inflammation of the throat.

An ordinary case commences with the usual symptoms of fever, accompanied with vomiting, pains and brief shivering. An extreme rapidity of the pulse is one of the characteristics of scarlet fever, but it goes for little as an indication of the gravity of the case. Attention

is soon called to the throat by complaints of soreness and difficulty of swallowing. The tonsils will be found to look red and angry, behind the furred tongue. Very probably one or two of the glands of the neck will enlarge and become painful.

The appearance of the tongue soon changes, the whiteness giving place to bright redness, through which will appear numerous light-coloured spots, a condition known as the "strawberry tongue."

Rash on second day.

The eruption appears usually within twenty-four hours, or, at all events, early on the second day; first on the neck and upper part of the body, whence it extends over the whole trunk and limbs. Slight swelling of the skin accompanies the rash. With the manifestation of the rash the bodily heat increases, and as it progresses, the throat becomes somewhat worse.

The rash is uniformly red, it disappears on pressure, but almost instantly returns. It lasts but a short time, reaching its height by the end of the third or beginning of the fourth day of the illness, and totally disappearing on the sixth day. Simultaneously the throat soreness and fever disappear, and shedding of the skin (desquamation) commences, in the form of bran-like scales, except from the soles of the feet and palms of the hands, where it separates in large pieces.

Desquamation.

Desquamation may last any time from eight to twenty days (Steiner) or even longer, and it must be remembered that till the process is complete, the patient is intensely capable of propagating the disease.

Broadly speaking, the danger to a case may be estimated by the violence of the throat affection. Rapidly destructive ulceration of the throat is attended with very great bodily prostration, delirium, a weak pulse, a dry fissured tongue, and a scanty eruption. The patient's

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condition is then very critical. Fortunately the number of such cases, even in England, is becoming much less, and we seldom meet with them in India.

The kidneys.

However mild a course the disease may run, it should be borne in mind that the kidneys suffer more or less in all cases, and that actual disease of these important organs may be excited by exposure to cold or errors in diet, and that this danger is at its height just as the child seems to be perfectly safe,—when all symptoms have vanished, during the third week. A dry skin, pallid complexion, a smoky colour of the urine, return of feverishness and puffiness of the face, point to affection of the kidneys (*see* Dropsy).

Scarlatina is recognised by the throat affection and the character of the eruption. Measles commences as a cold in the head a couple of weeks after exposure to infection ; scarlatina with sickness, high fever, and sore-throat within a week. The eruption does not appear till the third or fourth day in measles ; on the second day in scarlatina, and when it is seen there can be no confusion.

Prospects.

The prospects of the case will depend upon the presence or absence of those symptoms mentioned above as indicating a serious state of matters. The mildest case of scarlatina is, however, attended with some danger, more from the subsequent effects than from the disease directly.

Frequency.

Happily, in India, this disease is rare ; indeed, till late years, it was alleged that it was wholly unknown in the country, but this is not so. It is a disease requiring cool weather for its nurture ; the hot season seems to slay its vitality. In the cold season it is sometimes imported with the children of European regiments, but it disappears with the increasing heat. In England, scarlatina used to be, with the exception

of convulsions and diarrhœa, the most fatal of all infantile affections.

Treatment. Rigid isolation for the safety of others, and the freest ventilation compatible with the absence of actual cold, both for the patient's own sake, and to obviate the chances of conveyance of the infection by or to others, are matters of primary importance. Confinement to bed for two or three weeks at least is essential in all cases. Water, lemonade or conjee water may be liberally allowed. A very simple diet of Food. arrowroot, milk diluted with limewater, and chicken broth, to which, later on, it will be necessary to add stronger soups, should be given. "Caution is required as to meat, and even the supply of beef-tea should be limited, while milk can be given *ad libitum*, and eggs may be largely depended on" (Squire). The inhalation of steam from over a jug will be grateful to the throat and a drop or two of carbolic acid or eucalyptus oil may be first added to the boiling water in the jug with advantage. Sponging the surface with tepid water is useful and pleasant to the patient. The worse the throat is, the more concentrated should be the nourishment; should it proceed to ulceration and the tongue become dry, brandy or wine must be given in addition, but alcoholic stimulants are only to be used with great Stimulants. caution.

Inunctions. Dr. West speaks very highly of inunctions of suet into the whole surface twice a day as being more effectual, and giving more permanent relief than sponging. In any case, oil or suet inunctions should be practised during the stage of skin-scaling daily after a tepid bath.

Dr. Jamieson asserts that he has by means of antiseptic inunction completely prevented the spread of infection from the sick to the healthy. From the first

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onset of the fever the patient is anointed from head to foot (including hair), morning and evening with the following ointment :—

Carbolic Acid	...	...	gr. xxx
Thymol	...	...	gr. x
Vaseline	...	...	℥i
Simple ointment	...	...	℥i

A hot bath is given every night and the fauces are painted frequently with glycerine and boric acid.

Medicines.

As to *medicines*, a mild case requires very little interference. Even in a tolerably severe case it is not well to be in too great a hurry to rush to active measures. When the fever is at its commencement the fever mixture (38) should be used. Only in case of necessity is it right to give a purgative, and then it should be of the simplest nature (castor oil or Gregory's powder). Should the throat be very sore, it is a good plan to brush it with a solution of tincture of steel, glycerine and water or glycerine and boric acid ; otherwise it will be sufficient to allow the patient to suck ice, while either a warm linseed poultice or cold compress is applied externally, and constant gargling with a saline solution (common salt, ½ ounce to one pint of water), to dissolve the mucus, is carried on. It is not advisable to use Chlorate of Potash in large quantities for the throat, as it tends to irritate the kidneys. Chlorine gargle may be applied with a spray. As the fever declines, the mixture may be discontinued, and a stimulating medicine (64) substituted for three or four days, when it, in its turn, should be replaced by quinine (66) or chiretta (69).

Application to throat.

Complications.

Unfortunately, the troubles of scarlatina do not end with the attack. Dropsy, inflammation of the ear, abscesses of the glands of the neck, and general debility

of a serious nature, or an acute form of rheumatism may succeed.

Dropsy, when it occurs, appears during the period of skin-scaling, and is generally the result of cold, the child having been allowed up too soon. The vapour bath with saline purgatives, such as Epsom salts and senna, or Seidlitz powder, together with steel and quinine (70, 68) are to be employed to meet this emergency, while, at the same time, the most stringent precautions against cold are taken (*see* Dropsy).

Inflammation of the ear is to be treated upon general principles (*see* Ear).

Swelling and abscesses of the glands are to be treated with fomentations and poultices till they subside, or they should be lanced by a competent person; while the best nutriment, such as beef-tea, egg-flip, milk, and so forth, must be given with no sparing hand, and quinine and steel (68) administered persistently.

As after measles, so after scarlatina, though with even greater intensity, a state of *constitutional debility* may become established, and months if not years of judicious care may be required to induce return to perfect health.

The rheumatism which follows scarlet fever, though it may be very intense, is not of the same seriousness as an attack of acute rheumatism occurring *per se*, because it is unaccompanied by heart complications.

Caution.

N.B.—For a long time after recovery from scarlatina, the greatest caution must be exercised in permitting the child to go out of doors (even when the air is only cool the convalescent should be kept indoors), and in avoiding errors of diet, or in resorting to wine, lest the kidneys become affected.

The special measures previously given regarding the prevention and disinfection of this extremely

CHAP. XXII.

contagious complaint should be attended to throughout (p. 141). A patient is infectious from the onset of the first symptoms. Isolation should therefore be commenced at the earliest moment, and continued for seven or eight weeks.

CHAPTER XXIII.

GROUP II.—ERUPTIVE FEVERS—*continued.*

SMALL-POX.

SMALL-POX is a highly contagious eruptive fever. Children and especially infants are particularly prone to this disease and it often proves fatal. The fœtus in utero may get the disease if the mother is attacked.

Cause.

This disease is only propagated by means of infection. It is a most virulently infectious complaint, which may be communicated by the exhalations from the body and lungs of the patient so long as any of the scabs remain adherent to the body. It may be carried from person to person by the clothing, or conveyed through bedding. The germs will retain their vitality for a long period, and may live in wall-paper, old clothing, etc., for months, if not for years. About twelve days elapse from the time of exposure to the infection till the symptoms make their appearance. As a rule, it attacks the same person once only.

Incubation.

Varieties.

There are two varieties of small-pox, termed the *distinct* and the *confluent*. In the former the pustules remain distinct the one from the other. In the latter they run together into large patches. These so-called varieties are really only differences in degree of severity, the seriousness being proportionate to the quantity of the eruption, unless complications arise.

The course the disease runs will be better understood by dividing it into stages as follows :—The *first* stage is that of fever, and lasts from about forty-eight

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to sixty hours ; the *second* is that of eruption, followed by a remission of the general symptoms, and a fall of temperature until about the eighth day ; and the *third* is that of the secondary fever, which lasts for three or four days.

Symptoms of first stage.

First Stage.—The earliest symptoms are those which are common to other febrile disorders, but shivering is more marked than in any except ague. Vomiting and headache are usual. In older children, pain in the back and loins is so severe as to be almost characteristic, but in those of tender years it is so slight as hardly to attract attention. The temperature runs up to 103° or 104°, the tongue is furred, and the urine thick and scanty. These symptoms continue with increasing intensity till the third day, when the eruption appears—at first on the forehead and face, then on the wrist, and subsequently upon the body and limbs.

Eruption on third day.

Symptoms of second stage.

Second Stage.—Before the eruption is plainly visible it can be detected by passing the finger over the forehead, where the rough feel of the hard papules like small shot beneath the skin may be at once recognised. With the eruption comes relief, the fever greatly subsides, and all the symptoms are mitigated. The eruption passes through the stages of papule (pimple), vesicle (small blister), pustule (boil) and crust, as also occurs in each vaccination pock, after vaccination. At first the rash consists only of a number of simple red elevated papules, which come up through the skin, and do not merely lie upon its surface. They are peculiarly hard, nor do they contain any fluid till they are forty-eight hours old, when a whey-like liquid makes its appearance at the top of each. The surface of each vesicle, instead of being conically distended, is centrally depressed or saucer-shaped.

Fever subsides when eruption appears.

Description of eruption.

After the lapse of another period of forty-eight hours each pock becomes of a yellow colour, the clear fluid contents having been converted into matter. On the eighth day from the commencement of the disease the rash has attained its height. During the process of ripening—that is, while the vesicles are changing from white to yellow—the skin swells more or less, so much so that the eyes may become closed, and the whole appearance be dreadfully distorted. The eruption may involve the interior of the mouth and throat sufficiently to cause the patient distress, but the amount of fever throughout this stage is not great.

Swelling of the skin.

Third Stage.—The eruption has reached maturity on the eighth day; the temperature then rises again, and the general symptoms return till the tenth or eleventh day, when the pustules either dry up or burst and scabs form. Then this "secondary fever," as it is called, begins to decline. By the fourteenth day the scabbing is completed, the temperature normal, and convalescence has set in.

Symptoms of third stage.

Secondary fever.

In Confluent Small-pox the general symptoms and stages are as above related, but this form of the affection runs a much more violent course. The primary fever is more severe; there is much vomiting and not infrequently convulsions. The eruption comes out earlier; it matures more rapidly; it is much more profuse, and is so closely packed together as to show no intervals of sound skin between the vesicles. When the pustules break, the matter runs together, forming large brown or black scabs, which have an abominable smell. Of course such a great drain upon the constitution produces seriously depressing effects. With the secondary fever, which sets in earlier than in an ordinary case, there is liability to complications; delirium and cough being the most frequent.

Confluent small-pox.

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Once the eruption has appeared, there of course is no longer any doubt as to the nature of the case; but in the earlier stages the distinction is not so easily made. The following points will help to elucidate the question somewhat. Vomiting as an early symptom is very constant in small-pox, and is more severe than in *measles;* the back-ache and high rise of the temperature before the rash appears do not happen in measles. There is the absence of cold in the head and cough, which are constant symptoms in measles. The measles spot is much less raised than the small-pox papule, nor is it hard and "shot-like" under the finger. From *chicken-pox*, small-pox may be known by the mild fever of the former. The rash of the former complaint comes out within twenty-four hours, and that of small-pox not for at the least forty-eight hours. The matured eruption of chicken-pox is a large white, rounded bleb, which never becomes mattery; that of small-pox is not so large, it is saucer-shaped on the surface, and its contents soon become purulent.

Prospects.

The prospect of a case depend (1) chiefly upon the fact of previous vaccination or the reverse. Even imperfect vaccination will in all probability modify the attack and render it comparatively harmless (p. 101). (2) A mild introductory fever indicates a mild attack. (3) A scanty eruption is evidence to the same effect, and the liability to complications is then small. (4) The most favourable age for an attack is between the tenth and fifteenth years (Manson), and of course (5) in a disease of such exhausting suppuration, a previously strong constitution will justify us in auguring more favourably than when a child in an opposite state of health is attacked. (6) Confluent small-pox is always dangerous, and when occurring in the non-vaccinated is very fatal, about 50 per cent. dying.

(7) Chest complications, indicated by difficulty of breathing, cough, and hoarseness, must always cause anxiety. CHAP. XXIII.

From the ninth to the twelfth days are those of most danger. Convulsions are rare during small-pox. Among children of European soldiers in India small-pox is very uncommon, because of the great precautions which are taken in the matter of vaccination. As to the mortality which ensues among the unvaccinated, the reader is referred to the chapter upon vaccination. Frequency.

Isolation and disinfection, as described on a former page, must be rigorously carried out (pp. 132—134). Ventilation and a cool surrounding atmosphere, though without cold or draughts, are matters of importance. The bed-clothing should be light ; by heaping on clothes, considerable harm may be done. In this, as in all other fevers, sponging the surface has a soothing effect. There need be no dread that by doing so the eruption will be "driven in." Water may be freely allowed, as also may the fever drink (63), or limejuice and water (60). The diet should at first consist of milk and arrowroot, gruel, bread and milk, and a little beef-tea. The vital powers must never be allowed to flag, because the exhausting stage of suppuration has yet to be encountered. Under such simple management alone most cases of distinct small-pox will proceed satisfactorily ; but in the confluent variety, strong beef-tea, and milk with the yolk of egg, will have to be given from an early stage. And should signs of vital depression manifest themselves, it will be necessary to give wine or brandy with a liberal hand. Against the danger of great prostration, which sometimes supervenes with suddenness, "the greatest care and watchfulness are Treatment. Diet. Never allow powers to flag.

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required ; and if at any time the pulse becomes quicker and feebler, the surface pallid, and the pustules assume a flabby, half-empty appearance, if at the same time there be increased restlessness and delirium, then we must push our alcoholic remedies with increased vigour " (Tanner), as well as when typhoid symptoms supervene.

Stimulants.

The eyes should always be carefully looked to, lest they become damaged. Careful ablution with an eye lotion (23), and the application of simple ointment to the edges of the lids if they stick together, will generally be sufficient to effect this object. The hair should be cut short.

Medicines.

Do not purge the patient, though by all means see that moderate action of the bowels is established by mild medicines (48, 50) at the commencement of the case. The ordinary fever mixture (38) may be given during the primary fever, but need not be continued during the second stage, when the febrile heat is moderate. In the third stage, or that of secondary fever, benefit will be obtained from a stimulant mixture (64 or 65). But prevention of irritability of the bowels then claims most attention from medicines. Prescription No. 31 will probably be found the most beneficial in such a necessity, particularly if there be, at the same time, delirium ; otherwise a simple astringent such as No. 29 will answer the purpose. Dr. J. W. Moore, who is an authority on the subject, affirms that in quinine and tincture of steel (68) we possess most valuable antiseptic medicines for small-pox.

Convalescence.

Convalescence from small-pox is not usually a prolonged process. Once the patient has completely passed through the disease, recovery is steadily progressive ; but it will be well in most cases to administer a tonic (66, 68, or 69).

Prevention of pitting.

For the prevention of pitting a great many nostrums have been proposed. But all of these are of very doubtful benefit. There is, however, a method which is of some benefit, namely, placing the patient in a room from which all but the red rays of the spectrum are excluded by pasting red paper over the windows. Equal parts of olive oil and limewater, well shaken together into a thick emulsion, and smeared twice daily over the surface, certainly proves to some extent beneficial, as will anything that excludes the air, but the local application of turpentine or carbolic acid is much more effectual; both, however, specially the latter, are not without danger if extensively applied, in that they may be absorbed into the system, and produce untoward symptoms. If the application be restricted to the face and hands only, no such danger need be apprehended. The manner of using them is as follows:—Turpentine one part, olive oil four parts, shaken together, and applied night and morning by means of a feather; or carbolic acid twenty minims, glycerine one drachm and a half, and zinc ointment six drachms, mixed thoroughly together, is to be painted over the face and hands every second day. A very safe and good application is,—olive oil and limewater in equal parts to 7½ ounces, eucalyptus oil four drachms, prepared calamine powder one drachm. This application is to be put on with a camel's hair brush every three hours. Preventive treatment is simple. It is by vaccination and re-vaccination, efficiently performed (*vide* p. 101, Vaccination). Every case should be isolated until every scale has fallen off and the skin is smooth.

To destroy the disagreeable odour, "Sanitas" powder may be sprinkled about the room and bed.

Complications.

The complications which may arise from small-pox are inflammation of the ear, boils, inflammation of the

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lungs, bronchitis, and ophthalmia, which, when they occur, are to be treated as if they had arisen under ordinary circumstances.

Modified small-pox.

Modified small-pox is a name applied to the disease, as it occurs in a person who has previously been vaccinated. In such a case the whole course of the disease is so modified as to convert it into a trivial complaint, requiring no treatment; but the important point to know is that it is as infectious, and as capable of propagating the worst kind of small-pox as the most malignant form of that disease. The proper rash comes out at the usual time but scantily, and it dries up much earlier—on the fifth to the eighth day.

As dangerous as any as to infecting powers.

Malignant or *black* small-pox is fortunately not often met with, as it is invariably fatal. It is characterised by a violent onset, followed by hæmorrhages into the skin resembling deeply-stained bruises. The usual eruption is either very scanty or wholly absent, and the temperature is seldom very high. Malignant small-pox is never met with in vaccinated children.

CHAPTER XXIV.

GROUP II.—ERUPTIVE FEVERS—*continued.*

CHICKEN-POX.

Nature.

THIS is a trivial though infectious complaint, an eruption of successive crops of large vesicles, usually accompanied by fever, which appears some time within a fortnight after exposure to infection. The patient is infectious as soon as the rash appears, and remains so during convalescence. It is very common in India, where its attacks are by no means confined to childhood.

Symptoms.

For about twenty-four hours there is more or less fever, seldom much, and indisposition. Then the rash appears generally on the chest or back, and with it the fever almost goes away. The rash commences as a number of little red pimples, which on the second day fill with fluid. On the third day they have attained their maximum of size, and present an appearance as though the patient had been subjected to a shower of boiling water, which had left behind a number of small, almost clear blisters. On the fifth day the vesicles enlarge, become depressed in the centre, and then begin to dry up. On the eighth or ninth day the crusts thus formed commence to fall off, and the disease has come to an end, leaving the patient but little the worse for it.

Sometimes successive crops of vesicles appear every twenty-four hours, and may go on forming for ten or twelve days; but this is more common when the affection attacks the adult.

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The illness usually occurs only once, in the same individual, most commonly during childhood; but it conveys no protection from small-pox.

Distinction.

The very slight fever, and the large rounded clear vesicles, with only watery contents, distinguish it from small-pox (p. 227).

Treatment.

Recollecting that the complaint is contagious, it is as well to isolate a child so attacked. Little or no actual treatment is necessary. The patient should be kept within doors for a few days, abstain from animal food, and take a gentle purgative once or twice.

DENGUE.

Manner of commencement.

In children, this epidemic fever comes on with little warning. There may perhaps be some little malaise for a day previously. This is followed by acute pain in one or two joints, and chills and flushings for a few hours,

Symptoms.

which symptoms are succeeded by violent fever (104° to 105°) of some twenty-four hours or longer duration, the pains in the joints increasing in number and intensity all the while. The younger the child, the fewer the warnings: in a great many cases the accession of violent fever is the first symptom. The fever is accom-

First rash.

panied frequently by a peculiar mottled red rash or efflorescence on the palms of the hands, soles of the feet, neck, and cheeks, extending to the chest and trunk, and rarely there is some soreness of the throat. With the total decline of the fever (on the second day of its duration) this rash disappears. For a succeeding period of about forty-eight hours the child is comparatively free from pains, and completely so from fever. There is nothing more than weakness left behind; but the affection has not yet run its course. A second

Second eruption.

eruption, which exactly resembles that of measles, now succeeds, and with it a slight amount of fever and

restlessness ; all of which symptoms last for about twenty-four hours, frequently less. The after-pains, so common in the adult, seldom cause much trouble to infants and young children. Recovery is rapid, and no prolonged ill effects remain.

Distinction.

The recognition of the complaint is easy. The primary eruption is like that of scarlatina, but the rarity of scarlatina in India, and dengue being rarely associated with sorethroat and the fact that the fever and eruption appear almost simultaneously, are sufficient to prevent confusion. The secondary eruption is very similar to that of measles, but the previous occurrence of another form of eruption, and the intermediate cessation of the fever, are quite sufficient distinctions.

Prospects.

The prospects are almost always favourable. The only danger is from the great and sudden heat of the first twenty-four hours, when infants are liable to convulsions. Subsequent prostration is not so common as with adults who have been attacked.

Treatment.

Dengue is an affection which, like the other eruptive fevers, must run its course. Drugs, therefore, cannot cut it short. Upon proper management, rather than medicines, we must rely. In the first instance it will be desirable to give a mild aperient (48, 50, 52, 53). The patient should be kept in bed to avoid chill. During the febrile stages a fever mixture (36, 38) should be given. The important point in the case of young children is to moderate the bodily heat by means of spongings, the cold bath oil inunction, as the symptoms may demand, in the manner directed elsewhere (*see* Index). A quinine tonic (66) may afterwards be desirable.

ERYSIPELAS.

Erysipelas is an infective inflammatory process which occurs in two forms, Superficial or External.

CHAP. XXIV. Erysipelas affects the skin and subcutaneous areolar tissue. The other form attacks the deeper parts as well as the skin. It is due to a small round germ of the Streptococcus pyogenes family.

The germ most commonly enters the body by a wound, and the constitutional symptoms are usually well marked. A rash of bright red colour, having a distinct margin, appears around or near the wound. It spreads with great rapidity. Very often there is a chill or rigor with rise of temperature 102—105, and other fever symptoms convulsions often occur.

The fever continues as long as the rash is spreading. The disease is highly contagious to others suffering from open wounds. It is always serious and often fatal. It is common during the first two weeks of life, starting from the navel. Mosquito bites or other small abrasions and scratches are also starting points.

Treatment.—Absolute cleanliness and proper ventilation with pure air are essential. Hot fomentation and applications of Glycerin and Extract of Belladonna affords relief. Tincture of Perchloride of Iron may be applied over the inflammated area. It may also be given internally (10 drops every 4 hours). Cold lotions should never be employed "they lessen the vitality of the tissues and may then cause local sloughing."

Nourishing diet, tonics and stimulants should always be given from the beginning of the disease.

The doctor may wish to use special treatment by injecting germs or vaccines prepared from the germs of the disease. Many bad cases may be saved by such treatment.

CHAPTER XXV.

GROUP III.—MALARIAL FEVERS.

AGUE OR INTERMITTENT FEVER.

THIS is a non-contagious fever due to a parasite which develops in certain kinds of mosquitoes and is transmitted by them.

Malaria fever occurs more or less in all warm climates and is mostly prevalent in marshy districts; where the soil is moist and covered with pools of water and decomposing vegetable matter.

DESCRIPTION OF MALARIA PARASITE.

The parasites live and multiply in the red corpuscles of the blood. Each parasite on attaining maturity produces a number of spores which escape from the blood corpuscles, and it is when the spores escape that the patient gets the fever. As the parasite produces its spores every day—every other day—or every three days the fever is technically known as Quotidian, Tertian, or Quartan fever.

The fact is beyond doubt that all these fevers are conveyed by mosquitoes.

So you prevent being attacked by malaria by destroying mosquitoes (anopheles) which convey the infection.

Preventing infection through mosquito bites by the use of mosquito nets ; administering quinine sufficiently to prevent the development of the infection should the patient be already infected by mosquito bites.

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Extermination of Mosquitoes is not beyond the range of practical science. If we could only devise means to prevent the breeding of these dangerous pests we could stop the spread of this dreadful scourge. The usual plan adopted in this country for the purpose of destroying larvæ is to oil pools and tanks with kerosene. When the surface of the water is covered with a film of kerosene oil, the breeding of the larvæ is checked, and they die of suffocation. Chloride of lime moistened with common paraffin oil is very efficacious in destroying mosquito larvæ, but a great drawback in its use is that it is destructive to fishes, and gnats as well, which feed on the larvæ and perform the useful mission of a natural enemy, to them. Though unsuitable for tanks which abound in fish it is admirable in small pools and drains.

Marshy districts, pools and ponds, should also be freely drained.

The common kind of Mosquito (Culex) and the Malarial producing one (anopheles) with the larval forms, that live in water, are shown in the attached diagram.

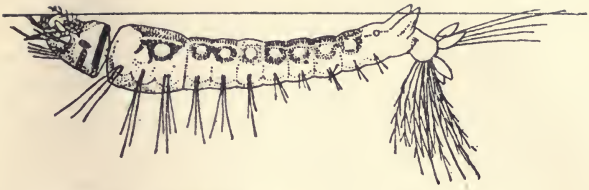
The difference of position of the adult forms when at rest on a wall and of the larval forms, when on the surface of the water should be noted.

Causes.

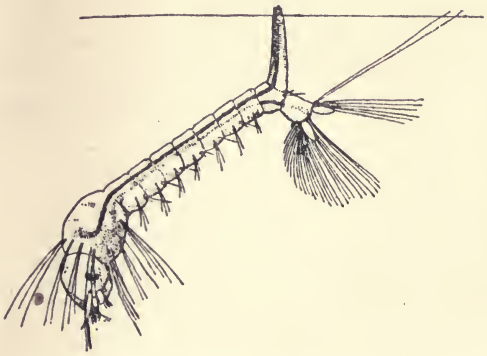
Symptoms:—There is a cold, a hot, and a sweating stage; succeeding the latter there is a complete intermission of the heat and of all the symptoms. The younger the child, the less the regularity observed by

Symptoms.

the symptoms. Frequently there is an absence of anything like shivering,—indeed, it is unusual, unless the child be over three or four years of age. Occasionally, but rarely, the attack subsides without sweating. The stages generally are of shorter duration than in the case of the adult, and sometimes even two paroxysms occur



LARVA OF ANOPHELES MOSQUITO AT SURFACE OF WATER.



LARVA OF CULEX MOSQUITO AT SURFACE OF WATER.

RESTING POSITION OF CULEX MOSQUITO.

RESTING POSITION OF ANOPHELES MOSQUITO.

in the twenty-four hours. The hot stage is, however, always well marked.

Course of an attack.

The premonitory symptoms are very slight, often not sufficient to attract any attention. The child does not seem really ill, but he yawns, refuses food, and lolls about. In most cases it will be observed that an attack is preceded by an unusually copious flow of urine; but after the fever has become established the urine is red and scanty. The ague fit begins with a feeling of cold ; the skin becomes pale, shrivelled, and rough ("goose-skin"). The finger-nails may be of a bluish colour. The skin feels cold, though the thermometer will even now show an unnatural rise of temperature, and the internal organs are congested from the blood being driven in. Shivering may ensue, but it is rare in young children. This stage may last from a quarter of an hour to two or three hours, and then succeeds the hot stage. A couple of hours after the fever has commenced, the temperature may rise to 104°, 105°, 106°, or even more, and the hot stage lasts from two to four hours. The decline down to the natural standard, or even a little below it, is equally rapid ; according to the amount of perspiration, so will be the rate of cooling.

Intermittent fever, when untreated, usually observes periodicity ; returning every day at the same hour, every other day, or every third day. When recurring daily, the cold stage is short and the hot stage long ; and when every third day, the opposite holds good.

When a child, who immediately before was in its usual health, is observed to refuse its food, to yawn, to loll about, and yet not to complain of feeling actually ill ; if at the same time the hands are felt to be cold while the thermometer shows the bodily heat to be greater than natural—we may be pretty sure an attack

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of ague is coming on. The extreme suddenness of the attack without any warning symptoms is sufficient to distinguish it.

Prospects.

An attack of ague is not in itself usually dangerous ; but one attack predisposes to a second attack so it should never be disregarded, because it is an indication that the child has come under a pernicious influence of the climate, by which much constitutional injury may eventually be effected. Indirectly, the effects of ague cause an immense amount of mischief to children in India ; indeed, the remote results are really much more fatal numerically than cholera, but because an attack is not immediately dangerous, such cases are ignored.

Treatment.

While the child complains of feeling cold, let it be well wrapped up ; a bottle of hot water rolled in flannel may be put to its feet, and some warm tea given. If the bowels be confined, a dose of castor oil (48) or Gregory's powder (50) had better be administered. When the heat of the body begins to cause inconvenience, the bed-clothing should be removed, and great attention devoted to the effects upon the nervous system, the means for reducing temperature (p. 179 *et seq.*) being put into practice as necessity demands. As to food and nursing, the rules recommended for the management of remittent fever are to be observed. From the commencement of the hot stage, the fever mixture (38 or 36) should be given every hour till the perspiration has been freely established. Now is the time for quinine. It is important that this particular period be seized upon for the administration of the medicine in a full dose (67). Quinine is really a specific in the treatment of malaria.

Time to give quinine.

The old rule of waiting till an hour or so before the next attack is due, is an extremely bad one. The

quinine then increases the irritability and nervousness, while it produces very little effect upon the disease. Nor is it well to withhold the drug till the normal temperature has been reached. In serious cases quinine may have to be given during the height of the fever, and even injected.

There need be no hurry in changing the clothes which have been wetted with perspiration. To do so prematurely risks chill and suspends further action of the skin.

About six hours after the first dose the quinine should be repeated. The chances are that the attack will not return, if, in the meantime, the child has been kept warm.

A repetition of the attack is to be treated in the same way as above, and after complete cessation, the quinine should be continued in diminishing doses twice a day for ten days or a fortnight. The greatest care must be taken to avoid chill.

After effects

THE SUBSEQUENT EFFECTS OF MALARIAL FEVERS.— Because these fevers are not attended with immediately serious consequences, they frequently meet with but little attention. Attack succeeds attack, at more or less long intervals. Each is "cured," and no more is thought of it till the next occurs, when it meets with a similar amount of consideration. In the meanwhile the changes which are at work are not observed, because they are so gradual in their outward manifestations. They are slow, it is true, but they are very certain.

Constitutional effects.

Almost every organ of the body is involved. Internal congestions are the earliest mischief. The spleen often becomes more or less enlarged. Intercurrent attacks of diarrhœa and dysentery are not infrequent. The child becomes pale and flabby.

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Possibly dropsy or jaundice may occur. The quality of the blood suffers in a most marked manner. It becomes watery, and contains but feebly vitalising qualities. In short, a persistently deleterious influence everywhere pervades the body, resulting in steadily advancing deterioration of the health, of which bloodlessness is the chief visible sign.

Seriousness.

Up to a certain point, this condition is quite capable of remedy; but beyond that point, remedies are of no avail; a stage of blood destruction may be reached which cannot be passed with hopes of recovery. Many such patients die, and their deaths are attributed to "diarrhœa," "debility," "atrophy," or whatever condition most attracted the attention towards the end.

Information from the temperature.

Throughout the whole course of the obscure illness which often succeeds repeated agues, or which, even sometimes without ague, indicates the malarial state, the thermometer should be regularly used. It will usually be found that the evening temperature rises to some point over 100°, it may be to 101°, but seldom more. So long as this is the case, we may be sure evil influences are at work. In the stage of recovery there usually occur intervals of a few days without a high temperature, which, however, may again recur and persist for other periods of some days, the intervals becoming longer, till there ceases to be any elevation. If after a fair trial of remedies the temperature persists without alteration, we may be certain the illness is gaining upon us.

Prevention and treatment.

The treatment of malarial disease is very important and very simple. The treatment may be summed up in a few words. It is to give quinine in efficient doses, milk and nourishing food, arsenic, iron, warmth of body, non-exposure and change of climate.

It is most important that in these cases the diet should consist largely of milk. It is a remedy which here possesses great value, and one without which the child is not having a fair chance. An attempt should be made to induce a child of four or five years of age to consume a seer of milk daily. Milk diet.

Quinine should be employed in full doses, *i.e.*, ten grains in the 24 hours (67) twice or thrice daily, so long as any signs of active fever remain. As soon as these are overcome, the quantity may be reduced, and it should subsequently be given in combination with iron (68) for about three months. Should this prescription seem to irritate the bowels, the syrup of iodide of iron (71) may be substituted; but in such a case, quinine must still be given in the intervals between the doses, twice a day. When the febrile state has wholly ceased, a prolonged course of arsenic and iron (3) is useful. Diarrhœa should always be at once treated (29), but care should be also taken that there is a daily action of the bowels. Quinine.

Moderate exercise during safe hours of the day is essential. Fatigue should never be incurred. Plenty of sleep should be indulged in, and if the child feel so inclined, he may be permitted to spend his mornings in bed. The exhaustion which the early morning walk is apt to induce proves hurtful in these circumstances besides which the cold of the morning air, if perceptible, will be injurious.

If after a fair trial of, say, a month, the febrile state remain constant, the case ought to be removed from the locality—to sea, if possible; if not to the hills. From a mere change from one district to another but little good need be expected, though it sometimes is useful when it is of a radical kind—such as from the Change of climate.

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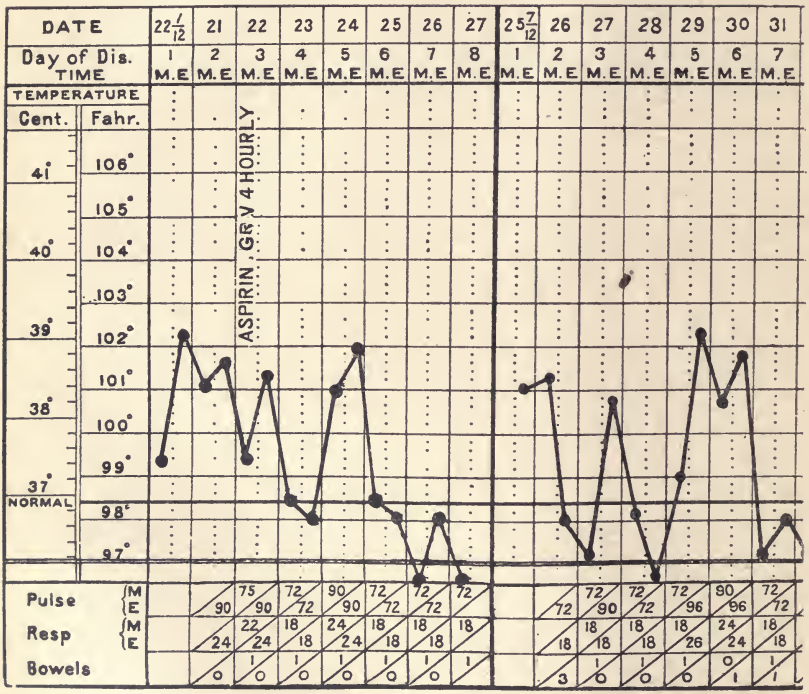
damp of an eastern Bengal district to a healthy place in the North-Western Provinces.

Of all conditions of health appertaining to the climate of India, this kind of chronic illness is *the* one calling for removal from this country to Europe.

TYPICAL SEVEN-DAY FEVER CHARTS.



Spleen not palpable. Headache. Pain in back.

Spleen not palpable. Headache. Pain in back.

CHAPTER XXVI.

GROUP IV—OTHER FEVERS. (*Of uncertain Origin.*)

SEVEN-DAY FEVER, SANDFLY FEVER.

BESIDES the cases described in the foregoing pages, there are cases where the temperature rises suddenly without any obvious cause, returning to normal after some time without any clue having been obtained as to the cause. These cases used to be regarded as of malarial origin, but recent investigations have proved them to be entirely of different origin. Our knowledge is as yet imperfect and incomplete, and attempts are being made to define them and find out their causes. Without entering into great detail we refer to them here as it is true that patients are very often dosed with quinine on the erroneous assumption that all cases of unknown fevers are due to Malaria Parasites.

Seven-day Fever.—This variety of fever, specially prevalent in Calcutta, is ushered in with a rigor and severe pain in the back and limbs. The temperature rises rapidly to about 104° to 105° and then gradually declines. The pulse is markedly slow. The fever generally lasts for about a week and occasionally for three days only, the temperature going up again before the fever breaks finally. A sense of depression and malaise follow for a few days; the patient makes an uninterrupted recovery otherwise. The temperature recorded in a chart gives a very characteristic outline known as "Saddle-Back"

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chart; by some this disease is thought to be Dengue.

Sandfly Fever.—A special type of fever has been described, characterised by fever of from one to four days' duration, with great nervous depression and muscular pain.

The fever is supposed to be conveyed by bites of a species of sandfly.

The temperature does not usually go high (101° F. or 102° F.) and comes down rather abruptly, and very often there is a second rise which is characteristic of this type of fever; in fact, there is a curve in the temperature that has been likened to "Saddle-Back." Whether there is any relation between Sandfly fever of Chitral and Seven-day Fever of Calcutta remains yet to be investigated. But there is a strange similarity between the two.

SUN-STROKE AND HEAT-STROKE.

Nature.

SUN-STROKE is really nothing more than a very sudden and aggravated attack of ardent fever produced by the heat of the sun's rays.

Fever has been stated to be a burning up of the body. So it is; but what originates the combustion? A poison has entered the blood, which produces its earliest effect upon the most tender point, namely, the nervous system. Thus we have shivering, depression, and other symptoms. Through default of the nervous system nutrition is impaired, and disintegration of the muscles is caused, whereby preternatural heat is produced. Now ardent fevers represent the effect upon the nervous system without the previous intervention of a poison such as is introduced in measles, small-pox, ague, and so forth. Sun-stroke represents a still more severe nervous shock, by which the nervous currents are even still more violently interfered with. We have, in fact, the climax of the febrile state produced almost instantaneously, secretion and excretion are suspended, and all the natural means of getting rid of heat are in abeyance. Accumulation of heat is the natural result, and the limit of temperature beyond which life is possible may be speedily reached; and, if passed,

paralysis of the heart and muscles of respiration succeed, and death is the result.

Causes.

Exposure to the direct rays of the sun or great heat in a confined atmosphere, particularly if a free supply of drinking-water is not available, are the causes of the attack.

Natural heat is produced within the body by chemical changes. Evaporation from the surface regulates it, and "so beautifully is this balance preserved, that the stability of the animal temperature in all countries has always been a subject of marvel. If, however, anything prevents this evaporation, radiation and the cooling effects of morning winds cannot cool the body sufficiently in the tropics. Then, no doubt, the temperature of the body rises, especially if in addition there is muscular exertion and production of heat from that cause" (Parkes).

Symptoms.

Excessive external heat is the sole cause, whether the patient be instantly struck down by the sun (sun-stroke), or whether he be less suddenly attacked by accumulated heat (heat-stroke).

Of the symptoms there is little to be said. The patient is insensible, the eyes are fixed, the pupils contracted, the white parts of the eyes are of a red colour, the breathing is rapid and after a time noisy, the heart may be observed to beat tumultuously against the chest, the skin is burning hot, and the patient appears as if dying. Convulsions may or may not occur.

Warnings.

These symptoms may be preceded by certain *premonitory* signs, such as thirst, suppression of the perspiration, giddiness, faintness, and suppression of the urine.

Treatment. Preventive.

Prevention.—Non-exposure to the sun, properly ventilated rooms, the use of the punkah, an abundance of cold drinking-water, and loose and light clothing, are the proper preventive measures. Upon the occurrence of premonitory symptoms, or indeed after any exhausting exposure to great heat, a cold

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bath should be given, a purgative administered, and the child kept quiet in a cool room under a punkah.

During attack.

Upon the Occurrence of an Attack.—Cold in the form of the cold bath, or of cold water poured continuously over the naked body, is the great remedy ; but for either to be efficient, they must be persisted in till the temperature is thoroughly reduced. Not a moment should be lost, lest the narrow line beyond which recovery is impossible be passed. As soon as swallowing power is regained, a dose of antifebrin (37) should be given ; then the patient should be laid in the coolest available place, and allowed there to sleep if he will, cold being still kept to the head. The thermometer should be in constant requisition, and should the temperature show any disposition again to rise, cold, as before, is to be resorted to. Great care is to be taken not to mistake the gradual approach of insensibility for sleep, but if the thermometer be sedulously employed* and the application of cold thereby regulated, there will not be much danger of this error occurring ; at the same time, sleep is not to be interfered with. Insensibility will not recur without an increase of bodily heat. Any disposition, after recovery, to restlessness and excitability should be met by the administration of a dose of chloral (8), followed by the bromide of potassium (9), and cold to the head. As soon as possible a purgative should be administered, none being better than the ordinary salts and senna ; and then the patient should be put upon moderate doses of quinine for a few days ; or, if there be anyone competent to do so, half the quantity of an ordinary dose may be injected beneath the skin before he has sufficiently recovered to be able to swallow medicine.

After treatment.

* By introducing the bulb one inch within the bowel.

DIVISION II—AFFECTIONS OF THE MOUTH.

CHAPTER XXVII.

THRUSH.

Definition.

THRUSH is one of those affections of early infancy (rare after the third month, except during the first dentition) which ought never to occur, and which will not occur in a well-managed infant. It is a disease of mismanagement, which is characterised by little white patches within the mouth. In itself it is a trivial complaint, though it is indicative of a depraved state of the digestive organs, unfavourable to assimilation.

Causes and nature.

The chief cause of thrush is an unsuitable diet, which, producing a disordered state of the system, originates an unhealthy condition of the mucous membrane of the mouth, and renders it a fitting soil for the lodgment and growth of a peculiar vegetable parasite. This parasite belongs to the yeast group, and is closely allied to, or identical with, that which exists in sour milk. The parasite thus suitably planted, there develops and causes spots of inflammation which present the appearances known as "thrush."

A dirty, sour state of the feeding-bottle or its nipple will also nourish the plant, which may thus become lodged in the child's mouth. The contagion may also be conveyed from one child to another by means of bottle nipples, comforters (chusni), spoons, and such like unless care be taken to keep them scrupulously clean.

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The affection is particularly common in the hot weather, which favours the growth of the fungus.

Symptoms.

At first there is merely redness and some tenderness inside the mouth, which, if carefully examined, will show numerous very minute transparent blebs. These (spots of lodgment of the parasite) inflame, burst, and form white specks, each perhaps only the size of the head of a pin, with a very narrow red surrounding. The interior of the mouth now becomes angry-looking. It is at this stage that the affection usually for the first time attracts the attention of the mother or nurse. The size of the patches next slightly increase, presenting an appearance as though minute portions of curd adhered to the inside of the cheek or lips; but it will be found that they cannot be moved about as could mere particles of food; nor can they be dislodged without some slight force, and if removed, they leave behind little ulcers, which bleed slightly.

Near the corners of the mouth, the inside of the lips, and the under surface of the tongue are the most frequent situations; but the spots may extend over the roof and back of the mouth, even to the tonsils and throat.

Diarrhœa.

Almost always there is some watery diarrhœa accompanying this state, which not infrequently, on account of its irritating nature, excoriates the buttocks.

The affection seldom occurs in a child who has not for some time previously been out of health. The healthy mouth will not nourish the seed even if introduced, the soil being unsuitable. Acidity of the stomach and bowels is usually present; the child has not been thriving, and it is thin.

Treatment. General.

Thorough cleanliness is the first essential. After each meal the mouth should be washed out with a little warm water. The bowels should be regulated by a

few doses of the red mixture ; but if there is much diarrhœa it may be necessary to give an astringent. To the milk, lime water should be liberally added. Many cases only require a little addition of cream to the diet and the application of boracic acid and glycerine to cure the disease. A minimum of sugar should be allowed. The child must be fed frequently, because the efforts at sucking may be so painful as to interfere with nutrition, and after each meal his mouth should be swabbed out with a piece of soft rag moistened with warm water.

Local. Destroy the parasite.

The next thing to be done is to destroy the parasite. This is easily accomplished by the application of borax and glycerine within the mouth after each swabbing. If glycerine be not obtainable, honey may be used, but it is not nearly so good. Another capital application is the hyposulphite of soda (one drachm to one ounce of water), which very quickly destroys the vegetation, but it may not always be easy to obtain the drug.

When the throat is involved.

When the mouth is extensively affected, particularly if the throat be involved, it will be desirable to give a mixture of chlorate of potash or carbonate of ammonia.

Good hygienic surroundings, supporting treatment, and a carefully regulated diet are essential.

Mother's nipples.

A mother who is suckling an infant affected with thrush is apt to suffer from sore nipples. She should therefore carefully wash her nipples with borax and water after each nursing.

CHAPTER XXVIII.

INFLAMMATION OF THE MOUTH.

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INFLAMMATION of the mouth is of three kinds—simple, severe, and dangerous.

I. Simple. Nature, etc.

1. SIMPLE INFLAMMATION OF THE MOUTH.—This is a trivial affection, engaging only the mucous membrane, and it in many respects resembles thrush in appearance; but it is a different disease, and does not depend upon the presence of a parasite. While thrush is exclusively an affection of early infancy, this inflammation never occurs at that period of life. It is most common between the ages of one and five years.

Different from Thrush.

Cause.

Its cause lies in a state of constitutional debility accompanied by disorder of the stomach. Sometimes it follows measles, when it not infrequently assumes some of the characters of diphtheria, and then of course it becomes a serious affair.

Symptoms.

The child is out of sorts; he is peevish, and he suffers from offensive diarrhœa for two or three days. The mouth then becomes sore, red, and hot. On inspection numerous spots of a dirty white colour surrounded by a red margin are observed within the cheek, upon the tip and edges of the tongue, the lower lip, and even upon the throat. These spots soon burst and form ulcers. Feeding is painful. Saliva dribbles freely from the mouth. As one crop of ulcers heals, another comes on, and thus, if unchecked by remedies, the affection may run a prolonged course.

Treatment.

Attention to the cleanliness of the mouth, regulation of the diet and of the bowels, by the red mixture,

and the use of an alum gargle (half a drachm to six ounces of water), will usually effect a ready cure; or, better still, borax may be used instead of the alum. Should any ulcer become large, it is well to touch it rapidly and gently with caustic, but this should not be repeated within an interval of two or three days. A vegetable tonic, such as chiretta (69), or quinine (66), should be given during and after convalescence. Should the case prove troublesome, a few doses of the chlorate of potash (2) will be useful.

Attacks the gums.

2. SEVERE INFLAMMATION OF THE MOUTH.—Attacks *chiefly the gums*. It usually occurs in children over two years who are debilitated, and who at the same time occupy close, unhealthy rooms, and obtain inappropriate, bad, or insufficient food. Among the natives it is common enough, and sometimes it is seen in neglected European children—not that the occurrence is absolute proof of neglect, though certainly strongly presumptive of it.

Symptoms.

On examining the mouth the affected portion of gum is seen to be swollen and of a dark violet-red colour. It is covered with a soft greyish deposit, which admits of easy removal, and the part bleeds easily. The amount of constitutional derangement which precedes this state of the gum is very variable, but as a rule it is not proportionate to the gravity of the case, or greater than that which ushers in the simple variety of mouth inflammation. Indeed, not infrequently the first thing that attracts attention is the offensively smelling breath and some swelling of the upper lip, which leads to the discovery of the state of the gum. At the same time the glands under the jaw at the affected side are apt to become sore and enlarged. The cheek next swells and becomes boggy to the feel; the impression of the teeth on the inside being retained. Soon

The cheek and gums.

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afterwards ulceration of the gum commences at the base of the teeth, from which point it proceeds with variable rapidity. Very fœtid saliva, streaked with blood, flows from the mouth. Those portions of the cheek which come into contact with the diseased gum may ulcerate to some extent. If the ulceration of the gum is extensive, the teeth will loosen, and even fall out. When the ulceration has ceased to spread, recovery is initiated; the swelling diminishes, the surface of the sore becomes clean, the flow of saliva diminishes, and the deposit on the gum lessens till it finally disappears.

Prospects.

As a rule cases properly treated recover, and the patient is convalescent at the end of a week or ten days.

Treatment.

Local.

Diet.

The utmost cleanliness of the parts must be observed. The mouth should be constantly washed out with warm water and salt, or with a weak solution of Condy's fluid (one drachm to eight ounces of water). The diet should consist of beef-tea, milk, raw egg and milk, pounded meat, and such like nutritious articles as the child can be induced to take, avoiding sweets and much farinaceous food. The brandy and egg mixture (*see* receipt 10) is always likely to do good. The bowels should be carefully regulated, neither constipation nor diarrhœa being permitted (49).

Bowels.

Chlorate of potash a specific.

From the commencement the chlorate of potash mixture (2) should be given and persisted in till recovery has been completely established. This medicine is most valuable in these cases, and if not at hand at the moment, should be procured in the crystalline form, by post, with as little delay as possible.

During convalescence a tonic (such as 65, and afterwards 68, 71) should be given till the strength is completely recovered, and it will be well to allow the child a little claret and water with its meals.

3. DANGEROUS INFLAMMATION OF THE MOUTH *affects the cheek*. This most formidable kind of inflammation and mortification of the cheek is known under the name of *cancrum oris*. It only attacks those who are in a very bad state of health and suffering from debility, and is most common between the ages of two and five years. Among poverty-stricken and half-starved native children it is comparatively common as a sequence of the ordinary malarial fevers of the country. Sometimes it occurs in unhealthy children after measles. Dirty and foul air will do much in such cases to initiate this calamity. European children sometimes suffer from it after very debilitating diseases.

3. Dangerous, or "cancrum oris."

Class attacked.

There is very little general illness to indicate what is coming. There is, moreover, very little, if any, local pain. The first thing observed will probably be a swollen, shiny cheek; "it looks as if the surface had been besmeared with oil, and in the centre of the swollen part there is generally a spot of a brighter red colour than that around" (West). The cheek feels hard. The breath is very fœtid, offensive saliva flows profusely, the glands under the jaw swell, the gums become spongy, and perhaps the teeth may loosen.

Symptoms come on.

Inside the mouth, opposite the red external spot, an ulcer will be detected—a dirty, ash-coloured, irregular sore. This ulcer increases in size, the red spot on the cheek becomes black, and the stench is great. High fever, much general disturbance, and prostration accompany the progress of the mortification, but there is no considerable local pain.

The ulcer.

Great constitutional sympathy.

Beyond the blackness a ring of bright redness will be observed. The black portion now begins to separate at the edges, till finally becoming detached, it leaves a hole through the cheek, opening into the cavity of the mouth—if the child has lived so long.

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Prospects.

The disease is of a most dangerous nature. Apart from the local trouble, there is the danger of the lung becoming infected from the mouth secretions or through the breath ; or a general blood-poisoning may ensue. Recovery is the exception. Should the patient survive the ordeal, great deformity is sure to result ; but after the complete restoration of the general health, operative surgery may be able to accomplish much in remedying this.

Treatment.

In the absence of a physician, the best thing that can be done is to support the patient's strength by every means in one's power. From the earliest moment jugged soups, the juice of raw meat (receipt 6), egg beaten up with brandy, and such highly-concentrated nutriment must be given with a liberal hand and at short intervals. One of the preparations of fluid beef, if procurable, will prove a valuable auxiliary. Night and day nutrition and stimulation are to be administered at intervals of an hour, except during actual sleep, which unfortunately is of rare occurrence. Emphatically life cannot be saved without energy and perseverance in this matter.

The passage of foul material into the air-passages may be partially prevented by keeping the child on its stomach, inclined to the affected side, and the head hanging over a pillow. The foul discharges tend thus to run outwards rather than backwards.

Local.

The parts should be repeatedly syringed with some non-poisonous fluid, such as salt and water, or Condy's fluid properly diluted (p. 256). Syringing with a solution of perchloride of mercury (1 in 1,000 of water) is no doubt more effectual, but this medicine is such a powerful poison that an amateur cannot be advised to compound it. The solution might, however, be procured. Swabbing the stinking slough with pure

carbolic acid is calculated to prevent spreading and blood-poisoning, but this should be done cautiously, and only once, or at most twice. The ulcer may freely be cauterised with nitric acid and dressed with iodoform. Injections of iodine have been used with success. 60 grs. of iodine are dissolved in an ounce of water (with enough of potassium iodide to allow solution of the iodine) and about 8 min. of this are injected at intervals of about half an inch so as to encircle the necrotic area into which also an injection is made. Of course, this could be done by a doctor only. A case has also been recorded in which after the disease had progressed to perforation of the cheek, application of red rays by means of a sixteen candle-power incandescent lamp with a red globe was followed by recovery. A small light poultice, made of pounded charcoal and linseed, will mitigate the stench, first smearing the surrounding parts with eucalyptus oil.

Opium.

When there is a tendency to delirium, total inability to sleep, and great restlessness, much benefit will be derived from a timely dose of opium (one drop of laudanum in twenty-four hours for every year of age completed); but caution must be observed not to produce depression by the use of this drug. Give the steel, quinine, and potash mixture internally.

Steel and potash.

After recovery

Should recovery eventuate, a tonic of steel and quinine (68) will prove valuable. Considerable deformity is sure to be left; but when the child's health has been entirely re-established, after the lapse of some months, the surgeon may be able to do much to remedy it.

DIVISION III—AFFECTIONS OF THE THROAT.

CHAPTER XXIX.

QUINSY, OR TONSILLITIS.

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Age of occurrence.

THIS is the ordinary inflammatory sorethroat. It is an unusual complaint in children under ten, and it is rare under five years of age.

An attack of quinsy often precedes rheumatism, or may replace it.

Cause.

It is commonly caused by cold, but insanitary surroundings are sometimes responsible. By some it is believed to be infectious.

Symptoms.

Slight chilliness succeeded by fever ushers in this complaint. Soon some soreness of the throat is complained of, the tongue is very furred, and the face is flushed. Swallowing is difficult and painful. Upon inspecting the back of the mouth, a tonsil (seldom both) will be seen swollen and red. After thirty-six or forty-eight hours, most probably the disease will begin to resolve itself. Sometimes, though seldom in the child, an abscess may form in the tonsil, and then, of course, the distress will be great and prolonged till it has burst.

Deafness may sometimes be a symptom, but it is of no importance, being due simply to the swollen tonsils temporarily blocking up the little ear-tubes from the mouth.

Difficulty of breathing is a possible but rare occurrence when an abscess is forming; though indeed it

may happen without any suppuration being present. The symptom is one which need not give anxiety; the child will not suffocate, even though an abscess should form.

Prospects.

There is never any danger. Repeated attacks may bring on chronic enlargement of the tonsils, and its attendant evils. A case usually lasts for six or seven days.

Treatment.

The treatment need only be of the simplest kind. Rest in bed, light diet, cooling drinks, and a brisk saline purgative (one drachm of Epsom salts in some water) or a dose of calomel. The inhalation of steam from over a jug.

Spray of—

Pot. Chloras.	...	gr. xv
Hydroclor. Acid dil.	...	m. x
Glycerin	...	ʒss
Aqua ad.	...	℥i

may be used with advantage or chlor. pot. or formalin lozenges may be given to suck. Fomentations followed by poultices to the throat, which should afterwards be wrapped in cotton-wool, and after twelve hours, swabbing the throat with a solution of nitrate of silver (10 grains to one ounce of distilled or rain-water), will effect a ready cure.

In the rare case of an abscess forming, if surgical assistance cannot be obtained, it must be left to burst. No attempt should be made by an amateur to open it.

CHRONIC ENLARGEMENT OF THE TONSILS.

Causes.

The important point to know about quinsy is the possibility of chronic enlargement of the tonsils resulting from repeated attacks, and the constitutional effects of such enlargement. But, unfortunately, chronic enlargement occurs sometimes in children who have

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never had quinsy, an unhealthy constitution being apparently sufficient cause in these cases.

Symptoms.

The tonsils will be found projecting so far as to touch or nearly to touch each other, thus partly obstructing the entrance of the air into the windpipe. As a result, the child snores loudly during sleep, the voice is thick, and there may be partial deafness. Almost always there is chronic cough, caused by the irritation ; sometimes there may be actual difficulty of breathing.

Effects.

Children so affected do not thrive. The narrowed orifice sufficiently impedes swallowing, even though there be no pain, to prevent the consumption of sufficient nutriment ; consequently we have emaciation. The difficulty of breathing prevents the full expansion of the chest, and the result is flattening, which remains permanent throughout life. Even should the condition be subsequently remedied, it is not always that the articulation becomes natural, or that the hearing will be as acute as it otherwise would have been.

Treatment.

This condition calls for special attention to all matters connected with the hygiene of the child. A life in the open air and an abundance of animal food are essentials. Cod liver oil and iron (71) and syr. ferri iodide should be administered persistently. Each day the tonsils should be freely brushed over with a solution of nitrate of silver (20 grains to 1 ounce of rain or distilled water), or pure tincture of iodine, perchloride of iron with glycerine or tannic acid and glycerine. The enlargements will sometimes, under this treatment, subside. But should they remain, or continue to increase, the child should be sent to a surgeon, who will remove the tonsils in whole or in part by a comparatively simple operation.

Adenoids.

ADENOIDS.—Adenoid growths or hypertrophy of the little glands (like tonsils) at the back of the throat

and nose is rather common in childhood and very often overlooked. The mucous membrane covering the posterior wall of the pharynx and posterior nares is thickened, and warty sessile or pedunculated masses may be felt, at times almost completely blocking the passage of air through the nose, and interfering thereby with the breathing. It is often associated with enlarged tonsils. This condition from the breathing being interfered with affects the growth of the child and is a cause of ill-health and backwardness. It predisposes to earache and other serious diseases of the ear.

Symptoms.

Sometimes a child as it grows may be observed to look stupid and seem to be a little deaf, keeping the mouth half open and snoring in its sleep. There is chronic nasal catarrh, frequent cough, and the sticky expectoration may possibly be slightly streaked with blood in the worst cases. A peculiarity is that the bridge of the nose has a tendency to become unnaturally broad and flat.

In such cases a surgeon's opinion should be obtained.

The affection is not serious of itself, but the consequences (appearance, deafness, etc.) would be detrimental to the child's after-life, and therefore attention to the condition is highly desirable.

Treatment.

Tannic acid and glycerine applied several times a day is likely to be useful, and good may be effected by blowing a little boracic acid powder up the nose from a quill, and by syringing through the nose with an alkaline lotion (Sod. Bicarb. gr. v to ℥i).

If these measures fail, the surgeon will probably remove the nodulated thickening by scraping with an appropriate instrument.

CHAPTER XXX.

CROUP.

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Varieties.

THIS is a disease of the throat, either chiefly spasmodic, or partly spasmodic and partly inflammatory in its nature, causing laryngitis.

In the past it was confused with diphtheria, and it is this confusion that has caused it to be considered so dangerous a complaint.

Upon the absence or presence of inflammatory exudation will depend the absence or presence of serious symptoms, and the intensity of the accompanying fever. For general practical purposes, therefore, it is important to classify the disease into (*a*) spasmodic croup, and (*b*) inflammatory croup, though there is probably always some inflammation present.

Spasmodic symptoms.

1. SPASMODIC CROUP is a comparatively mild complaint. It may commence either with symptoms of a slight cold, cough, and perhaps slight fever or it may be ushered in at once without any introductory symptoms, by a sudden attack of difficulty of breathing.

Usually, however, there is a hoarse metallic cough, some general indisposition, a foul tongue, and a quick pulse; sometimes there is a history of convulsions. The respiration soon becomes crowing—that is, at each endeavour to draw air in through the spasmodically narrowed orifice of the throat a peculiar sound is produced—a sign which is unmistakable. An attack of difficulty of breathing follows; it occurs as a sudden paroxysm, usually at night, and it may last for an hour

or longer. After the attack the child is tolerably well, the voice perhaps remaining a little hoarse, but that is all. A similar attack may occur on the following night if not sooner. Throughout, the fever, if present at all, is but slight; and it subsides after the attack, leaving the child comparatively well and able to run about, almost free from all throat symptoms. Of the cause of this complaint we know nothing more than that cold is sufficient to induce it in those who are predisposed.* It is often associated with rickets. An emetic of ipecacuanha wine (40) had better be given as soon as the case comes under observation. Steam should be inhaled, an alterative purgative (56) administered, and the child, when the paroxysm commences, should be put into a warm bath. A dose of mixture No. 7 is often very useful at this stage. After an hour the emetic may be repeated if needful, as also may the bath. The air of the room should be rendered warm and damp (by putting water in a kettle, the spout of which projects into the room, on the fire), but not over-heated: as a rule, the room is made much too hot. Fomentations to the throat in the shape of a sponge wrung out of hot water and applied will also prove useful. A dose of chloral (8) should be given, and the paroxysm having passed, the bromide of potassium mixture (9) commenced, and continued steadily for two days or so after the complete recovery of the child. After the subsidence of the immediate effects Cod liver oil, Syrup of lactophosphate of lime and iron should be given regularly for some time. Non-exposure to cold, and careful regulation of

Cause.

Treatment.

* The muscles at the orifice of a child's throat are peculiarly irritable, and easily excited to spasm. The difficulty of breathing is due chiefly to this spasm, but partly, too, to the swelling of the part and the accumulation of mucus.

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the diet and bowels, are points demanding special attention for some time following.

Upon the reappearance of any acute symptoms, a few drops of ipecacuanha wine should be given every hour, so as to produce and perpetuate nausea, till the symptoms subside.

Child-crowing.

There is a form of spasm of the throat called CHILD-CROWING, which is most frequently met with during teething between the ages of six and nine months, but sometimes later. It is more frequent among hand-fed children than others, and among the weakly than the strong. A drooping infant, on waking from sleep, when sucking, or crying makes a strange crowing sound, at first not very loud. After a time this increases to paroxysms of difficulty of breathing, which may be so severe as to produce lividity of the face. At the end of a few moments, however, the spasm yields, air is drawn in through the narrow chink with a shrill crowing sound, and the paroxysm is over. But it recurs again and again at intervals, perhaps of a few hours, perhaps not for days. Sleep usually succeeds an attack, after which the infant is apparently as well as ever till a recurrence happens. The affection is not accompanied by fever unless there be any other disease present.

Causes.

This affection is more of the nature of a convulsion of the throat than anything else. It is particularly common during teething, which often causes it ; over-feeding and constipation predispose to it. A condition of health below par is, however, a necessary preliminary, and rickety children are peculiarly liable to it.

Prospects.

These cases usually do well, but if the attacks increase in frequency and severity, they may wear a child out, till exhaustion and general convulsions ensue, and lead to a fatal termination in a small number of cases.

Treatment.

During an attack we should proceed as when restoring a stillborn child, by slapping it, dashing cold water upon it, exposing it to a cold current of air, pulling the tongue forward, and, if necessary, employing artificial respiration (p. 24). The warm bath should always be used, and a sponge wrung out of hot water, may be applied to the throat under the chin, while smelling salts is held for a moment at intervals to the nostrils. In the intervals between attacks we should endeavour to remove the cause by lancing any pressing tooth, and by attending to the diet and nursing. The bowels should be kept moderately loose. Cold-water bathing twice or three times a day is a means of prevention which, it is said, few cases will resist. Bromide of potassium (9) should be used when an attack threatens, or till the excitement following it has subsided, and its administration may be preceded by one or two doses of chloral (8). Tonics are very essential, and of these the iodide of iron and cod-liver oil (71) is the best form of exhibition, but of course the active symptoms must first have been controlled. The child should, contrary to the general idea, be kept in a cool atmosphere.

2. Inflammatory.

2. INFLAMMATORY CROUP is a serious affection. By many high authorities it is believed to be the same disease as diphtheria, only expressing itself differently by spasmodic symptoms because a lower part of the throat is affected, but there is strong ground for maintaining that the diseases are perfectly distinct in their natures.

Nature.

It consists of an acute inflammation of the mucous membrane lining the top of the windpipe. The tonsils are often enlarged. As a result of the inflammation, swelling and the exudation of a white incrustation or "false membrane" ensue, which so block up the

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narrow air aperture as almost or altogether to close it. At the same time spasms of the throat occur at intervals, producing paroxysms of cramp and difficulty of breathing.

Symptoms.

At first there are all the symptoms of a common cold, with fever, thirst, drowsiness, and running at the nose. The child complains of his throat, at which he clutches when swallowing. Hoarseness comes on, to which after a time is added the rough ringing cough. The fever increases, and these symptoms continue for

The attack.

some twenty-four or thirty-six hours. At night an attack of difficulty of breathing causes the child to awake in a fright, gasping for breath. The paroxsym passes, and during the rest of the night the metallic cough, crowing and impeded respiration continue, leaving the child exhausted in the morning, restless, flushed, the voice almost extinct. A slight improvement succeeds, and a little sleep may be obtained, but the amendment is only temporary. As the day goes on, the force of the fever again increases, and the paroxysm returns with greater violence than before. Perhaps, the face may become livid, and the natural tint may not be recovered even between the paroxysms. If the skin between the ribs becomes depressed at each respiration, we may be sure that little air is entering the lungs. Cold, clammy sweats, a rapid, weak pulse, drowsiness, and lividity of the face, indicate an alarming condition.

Prospects.

This kind of croup is always serious ; but so long as the symptoms last mentioned are absent, the case may be regarded hopefully.

Distinction.

It may be known from the spasmodic variety by the preliminary fever, the hoarseness, the feeble or extinct voice, the continuousness of the fever, the increasing difficulty of breathing, and chiefly by the fact that the

croupal sound continues during the intervals between the paroxysms. CHAP. XXX.

As soon as it is suspected that a child has croup, he should be placed in a warm bath for ten minutes or so, and he should then be put to bed in a room the air of which is warm and moist. By attaching a tube to the spout of a kettle which is kept boiling on the fire, the steam will be led into the room, and if the tube be long enough, it may be led close to the child underneath a blanket tent (one side of which is left open) constructed over the bed ; but it is a matter of great importance that the child be not half stewed and half suffocated in a confined, humid, and contaminated space, as is too often done. A teaspoonful of terebene may with advantage be added to the water in the kettle. An emetic (39, 40) should now be given, or if the symptoms have been urgent, it ought to have been the first thing done. The bowels, which are usually costive, should be acted upon after the emetic by a brisk purgative (56). Poultices and hot fomentations often give relief. A large sponge wrung out of hot water should be applied to the throat and alternated with another till the skin becomes red and irritated, and afterwards the part should be wrapped in cotton-wool. The inhalation of steam is soothing, and therefore useful ; and it is a good plan to add about twenty drops of carbolic acid to the hot water of each inhalation.

Treatment. Moist air. Emetic. Bowels. Fomentations and inhalations.

After some four hours or so, it is well to repeat the emetic, and in the meantime the child should have been kept slightly nauseated by means of ipecacuanha (five drops or less of the wine each hour upon a lump of sugar will answer), or by the frequent use of mixture No. 36.

Keep up nausea.

Troublesome cough at this stage is frequently much relieved by poulticing the chest effectually before and behind.

Poultice chest.

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These means usually sufficient. If not, prescribe.

Very frequently the above measures, or a repetition of them, will cut short an attack of croup. But should the case still continue to proceed badly, the mixture is to be omitted, and an alterative and antispasmodic substituted in the form of mixture—

Tinct. Benzoin co.	...	m. x
Syrup Scillæ	...	3ss
Ext. Glycyrrth Liq.	...	3ss
Aqua	...	3ii

of which one teaspoonful should be given every second hour night and day.

Diet.

The diet at first should be very light, and consist chiefly of slops; but as we omit the depressing medicines, a more liberal allowance must be given, pretty rapid advance being made so as to anticipate the accession of constitutional depression. Beef-tea and wine ought to be given upon the slightest appearance of typhoid symptoms.

DIVISION IV—AFFECTIONS OF THE CHEST.

CHAPTER XXXI.

COUGH, INFLAMMATION OF THE CHEST, BRONCHITIS, BREATHLESSNESS.

Only a symptom.

COUGH is in reality but a symptom, it is not a disease in itself. It is, however, such a constant and early symptom that it primarily attracts attention in cases of chest affection. Cough may imply very little or it may mean a great deal. We are familiar with the expressions, "slight cough," "bad cough," and so forth, and we understand the great differences in their signification.

Frequency.

No less than one-fifth of all the children under five years of age who die in London succumb to diseases of the organs of respiration. In India there is not the same liability to these complaints, and when they do occur, they run a milder course; still there is no lack of such cases.

Ordinary cold.

An ordinary COUGH AND COLD is a trivial affair, consisting of irritation of the membrane lining the nose, eyelids, and upper part of the throat. It is not necessary to occupy space by entering into a description of the symptoms of this affection, which are known to all; or to detail the simple household treatment which effects a ready cure. Prescription 46 is a suitable domestic cough medicine.

INFLAMMATION OF THE CHEST.

Inflammation of chest.

To be able to discriminate between such unimportant complaints, and the more serious condition of

CHAP. XXXI. INFLAMMATION OF THE CHEST, the presence of which is also notified by the existence of cough, is very important.

It is not necessary here to attempt any detailed description of bronchitis, pleurisy, inflammation of the lungs and so forth, for the all-sufficient reason that the treatment which non-professional persons have it in their power to adopt does not differ in any of these cases, and that the difficulty of discriminating each accurately would be insurmountable to them in the majority of instances.

Broadly it may be stated here that the inflammation may either be in the mucous membrane lining the air passages (bronchitis) or may be inflammation of the lung substance (pneumonia or inflammation of the oil sack as it were) between the lungs and chest wall (pleurisy).

Bronchitis.—Bronchitis may be either acute or chronic. In the chronic form of bronchitis the symptoms are of much the same character as in the acute form but less severe, though, perhaps, of longer duration. The majority of cases recover in a few days or weeks with careful management and nursing.

Pneumonia.—Pneumonia, however, is a much more serious complaint. It runs a fairly definite course and presents well defined characters.

Symptoms. The onset is sudden and is marked by a sense of chilliness or rigor. There is high fever and quick pulse, shallow rapid breathing, and pain in the affected side and perhaps vomiting. Convulsions not uncommon in children and if the fever is high delirium supervenes. The face of the child is flushed and herpes often appears on the side of the mouth. There is usually cough. In young children there is no expectoration, but in older ones the sputum is tenacious, viscid and rusty coloured.

The respirations are shallow and rapid being possibly 40 per minute or more, pulse 130 to 140 and temperature 104°F. or thereabouts. The temperature during the course of the attack remains high. The symptoms continue for about a week, when usually between the sixth and nineth day the fever generally abates. This is followed by marked general improvement. Respiration and pulse return to normal, the skin becomes moist, the expectoration gradually diminishes and loses its colour.

Pleurisy.—Pleurisy is not an uncommon disease in infancy and childhood—specially after an attack of measles or scarlet fever, or it may be secondary to any inflammatory disease of the lung itself—tuberculosis and pneumonia. It may be due to cold or exposure or may result from injury to the chest.

In the first stage known as dry pleurisy the surfaces of the membrane are roughened. Fever, cough and acute pain in the chest are the usual symptoms complained of. The child will usually lie in bed on the back or on the sound side. In the second stage (effusion) there is an exudation of lymph or serum or pus between the chest wall and the pleura. The pain is diminished, but there is considerable difficulty of breathing.

Causes.

Chills, the result of improper exposure, are the most constant causes of these attacks. Want of proper ventilation will do much as a predisposing cause. There is a special liability among those who have once suffered from a chest inflammation to a recurrence upon slight exposure. A child who once gets bronchitis is pretty sure during its childhood to suffer from a repetition of the ailment unless special precautions be adopted. Boys are more frequently attacked than girls, probably because they are more exposed. The age of a

CHAP. XXXI.

Exemption of young infants.

child has a great deal to say in the matter ; strange though it appear, considering their extreme delicacy, it is a fact that during the first two months of life, infants are singularly free from liability to these affections of the chest. Exposure of such young infants will tell upon the liver and bowels, and it will cause very severe "cold in the head," an affection to which they are peculiarly liable, but it will not usually cause a chest disease. Even up to three or four months there is lessened liability, but from this age till eighteen months the susceptibility increases, again to diminish as childhood advances. At teething periods, when the nervous excitability is at its height, children are particularly liable to chest inflammation if exposed. As a consequence of measles and some other fevers, chest affections may occur, and then generally in a most insidious and dangerous form.

Periods of greatest liability.

When from any cause there is reason to believe that the chest is affected, an examination into the points enumerated at p. 170 should be made without any undue exposure. This having been done, we proceed to consider the symptoms which notify such an occurrence.

Symptoms.

The child suffers from what is deemed to be an ordinary cold, perhaps for a day or two. But, instead of recovering, the cough becomes aggravated and distressing, the skin hot and dry, and the breathing hurried. A sucking infant will drop the nipple, cough more or less violently for a time, and make another futile attempt to suck. The heat of skin increases towards night, the breathing will probably be wheezing, and the little patient becomes restless, thirsty, and unable to sleep. As morning approaches, perhaps from sheer weariness a little sleep is obtained ; but upon waking, the suffering from difficulty of breathing and coughing is much greater than before, owing to the accumulation of

secretion in the air-tubes. After prolonged and exhausting efforts, which perhaps may induce vomiting, the passages are cleared and these symptoms subside. Expectoration is seldom observed, because children swallow it as soon as it reaches the mouth (a matter of no consequence) ; but if there has been vomiting the ejected substance will be seen to contain much slimy mucus. In other cases, where the tubes are not so much engaged as the substance of the lung itself, we notice at this period very high fever with a dry, catching, painful cough ; a flushed face, dilated nostril, panting respiration, and an unusually bright eye. The urine is thick, the bowels constipated, the tongue coated behind and red at the tip. As time passes the face becomes heavy, pale, and of an earthy tint. Notwithstanding that the restlessness is extreme and the child tosses from side to side, there are intervals of drowsiness. If after five or six days the symptoms do not become markedly alleviated, if there is a sunken, pallid, or livid face, with increased restlessness, rapid panting, or loud wheezing, the body being hot while the hands and feet remain cold, and if occasional cold, clammy perspirations break out, the case is progressing very unfavourably.

Symptoms of bad omen.

One severe form of chest inflammation commences with a short, sharp, shivering fit, followed by intense fever, hurried respiration, a short, dry, rapid cough, and vomiting. Sometimes in these cases convulsions occur at an early stage.

Symptoms of severe inflammation.

Chest inflammations which follow measles, etc., frequently advance so gradually and insidiously as to escape detection.

The fever, vomiting, and headache, with which a severe chest complaint is introduced, may sometimes be mistaken for some affection of the head, a suspicion which the occurrence of a convulsion would be held to

Distinction from head affections.

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confirm. It therefore behoves us to be able to discriminate between the two. The vomiting, restless nights, talking in the sleep, fever, and constipated bowels may originate the misconception ; but in chest affections the vomiting is short and decisive, and nausea does not exist. In head affections nausea and irritability of the stomach are constant. The sudden rise of temperature when the lung is at fault, and the quickened breathing, uniform in its rapidity, not jerky, or only quick by starts, are sufficiently distinctive.

From croup.

It is hardly possible in ordinary cases to confound chest inflammation with croup : the paroxysms of the latter, the husky voice, and the crowing respirations ought to remove all doubt.

From whooping-cough.

Nor can the cough well be mistaken for that of whooping-cough with its characteristic whoop, its intervals of complete relief and absence of wheezing. The presence of wheezing, either heard or felt, will distinguish bronchitis from either of the two last-named affections.

Prospects.

Obviously if both lungs are affected, the danger is greatly increased. The temperature is a good guide as to the amount of danger present ; a heat of 104° or 105°, if it continues for more than a day, is sufficient to occasion grave anxiety. An inflammation of the substance of the lung (pneumonia) is always a more serious affair than inflammation of the lining of the air-tubes (bronchitis) ; but both conditions are often present. As an indication of seriousness, the distinctions may therefore be noted as shown on the next page.

Treatment.

The child, clothed in flannel, should be put to bed the moment it is discovered that the chest is affected.

Emetic.

An emetic of ipecacuanha should then be administered.

Poultices.

The affected side of the chest both before and behind is to be enveloped in a large, light bran poultice.

The mixture Liq. Ammon. acetas vi ; Ammon. Carb. gr. v. ; Tinct. Aconite m. v ; Aqua ℥i ; E. 4 hrs. It may be necessary now to adopt measures to reduce the temperature as detailed in Chapter XVI. Complete rest to the patient, and surrounding quiet, are matters of much greater consequence than usually imagined. The room had better be slightly darkened, but should be warm and well ventilated, and as little conversation as possible held with the child.

Medicine.

The room.

Pneumonia.	Bronchitis.
1. Temperature from 103° to 105°.	1. Temperature seldom above 102°.
2. Skin always hot and dry.	2. Skin frequently moist.
3. Tongue and lips bright red.	3. Tongue and lips natural.
4. Cough dry and hard.	4. Cough lose and moist.
5. Breathing difficult and rapid, but not wheezing or rattling.	5. Breathing wheezing or rattling throughout.
6. The affected side is dull on percussion.	6. Absence of dulness.

Pathology.

In bronchitis the lining of the air-tubes is inflamed, and it pours forth additional mucus, the air still entering to some extent, and producing in its passage the wheezing or rattling sounds. It may affect only the larger tubes, and is then not nearly so serious as when it spreads to the smaller tubes. In *pneumonia* the substance of the lung is inflamed. The lung may then become solid like a piece of flesh, when it is, of course, unable to admit any air into the affected part. When recovery is taking place, this solidity breaks down or dissolves, forming a thick matter which elder children will expectorate ; and when this softening occurs, we have a rattling sound and a soft cough.

Difficult breathing to be met with emetics.

Should difficulty of breathing occasion annoyance, the ipecacuanha emetic may with advantage be repeated,—indeed, it is well to do so if the secretion of mucus be copious, whether there be difficulty of breathing or not ; and if the difficulty be accompanied with a dry, hacking cough, no wheezing, and with high

CHAP. XXXI.

Stimulating Poultices.

fever, flour or linseed poultices with which mustard has been mixed, should be substituted for those of bran, and they should be frequently renewed, till the skin can no longer bear the irritant, when the chest should be wrapped in cotton-wool secured by a flannel band. Blisters or mustard plasters should never be employed.

Over-poulticing a child and over-weighting it with heavy wraps do more harm than good by depressing the vitality, restricting the movements, impeding the respiration, and diminishing its comfort.

Avoid over-heating the room.

Similarly the atmosphere of the sick-room is too frequently oppressive and over-heated, converted into a sort of unwholesome steam-bath, in the dread of "fresh cold." In no class of cases is proper ventilation more essential than when the lungs are disabled. The struggle is for fresh air, and of this the patient is deprived through mistaken kindness.

Bowels.

The condition of the bowels is a matter not to be neglected. Constipation is usual; it should be relieved by castor oil or some other appropriate medicine; but in the course of the disease diarrhœa is not uncommon, and should be met without undue delay, by an astringent.

Ventilation.

Steam inhalation.

The air of the room should be kept fresh, warm, and of an uniform temperature. The inhalation of steam is useful and allays irritation.

Sleeplessness.

Great caution must be observed in giving medicines to produce sleep. Opiates in any form are to be avoided, and chloral is equally dangerous. The writer agrees with Dr. Whitla that "sulphonal, given in a little whisky punch, is the best of all hypnotics" in a serious chest inflammation. It may also be given in hot soup in a dose of five grains for a child of five.

Diet and drink.

The diet should be very simple, consisting at first of mere slops. It is of more importance than may be thought that the child be permitted to drink bland

fluids, such as barley water, toast water, milk and soda water, or even plain water, freely ; whereby the skin may be induced to act, and the naturally scanty urine augmented. Milk and arrowroot is a good food at first, but the strength must not be allowed to run down, and soon beef-tea and eggs should be added.

When stimulants are to be commenced.

After thirty-six hours, or less if the acute symptoms (high fever, hardness of cough, restlessness, and great thirst) have passed away, the depressing mixture should be discontinued, and No. 47 (2) substituted for it ; or if the cough be the chief symptom, No. 47 (3) will answer the purpose better.

Food and medicine during convalescence.

At this stage stimulating liniments (18) employed with friction will do much good by loosening the phlegm and promoting absorption. After a rubbing the chest ought to be wrapped in cotton-wool.

Now veal or chicken-broth, or beef-tea, and such-like simple nutritious diet, should be adopted.

As the cough becomes loose and the fever slight, the child, though better, still being weak, the diet must be made more liberal ; a little largely diluted wine may be given twice a day or oftener, with or after food, and the stimulant mixture (No. 65) used instead of the cough medicine.

Typhoid symptoms.

Symptoms of a typhoid nature are always to be met with liberal stimulation, constant feeding, and great attention to all details of nursing. Nursing in pneumonia is of the highest importance.

Inhalation of oxygen in cases with much dyspnœa and cyanosis is useful.

Lance gums.

In every case the teeth must be examined, and any part of the gums requiring it should be freely lanced.

Tonics.

During recovery tonics (68, 71) ought to be given.

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CHRONIC BRONCHITIS

Cause.

Is generally the remains of an acute attack, and is more common in elder children, those from five upwards.

Symptoms.

The cough continues ; it is soft and moist in its nature, but at night it becomes distressing. The pulse is quick, there is a tendency to night sweats, the child remains emaciated, the face continues pale, the eyes hollow, and the lips are dry and cracked. The patient picks at his nose constantly.

Nature of expectoration.

If old enough to expectorate, frothy white sticky mucus is spat up. These symptoms may go on for weeks if not checked, and may reduce the child to an alarming state of debility and emaciation. With care, however, a return to complete health may be looked for.

Treatment.

An occasional emetic may be necessary to free the tubes of mucus, but the general treatment must be of

To be of a stimulating nature throughout.

a stimulating and invigorating nature. When the weather permits it with absolute safety, the child should be sent out of doors; when in the house, he should be kept out of draughts, and as much as possible confined to a well-ventilated room or rooms of equable temperature. The chest should be rubbed night and morning with the turpentine and camphor liniment (18), or with heated mustard oil till pimples appear. Wine should be given twice or three times a day with the meals, and a stimulating expectorant (47) prescribed ; or a couple of drops of "pure terebene" (from the chemist) given on a lump of sugar three or four times a day, often greatly checks the secretion and promotes the expulsion of phlegm. By every possible means the strength should be kept up by good food, without overloading the stomach. The addition of pepsine (74) to the food will be found greatly to aid nutrition and to increase the appetite. As soon as the child is able to eat fairly well, the

mixture may be omitted, and the iodide of iron and cod liver oil (71) substituted for it. A change of climate is always calculated to be of great benefit.

BREATHLESSNESS (ASTHMA).

Asthma rare.

True asthma is very rare in childhood, but breathlessness, either more or less habitual, occurring paroxysmally, or dependent upon exertion, is not extremely infrequent. The subject is here only alluded to, briefly to convey some information to guide parents.

Varieties.

Habitual breathlessness is most likely due to chronic bronchitis, or some allied lung affection, and should be treated as already directed.

Paroxysmal attacks of breathlessness may be due to child-crowing to the pressure of deeply-seated enlarged glands upon the windpipe, to the pressure of a foreign body in the windpipe (*see* Accidents), and occasionally to asthma.

When caused by exertion, the child being at ease when at rest, especially if there has been a previous attack of rheumatism, we may suspect the heart ; but it must be recollected that exertion may excite paroxysms when there are enlarged glands pressing in the way mentioned.

Management. Plenty of fresh air.

The cases which are due to the pressure of glands should be treated with iodide of iron and cod liver oil, change of air, and great attention to food and hygiene. These measures will also prove useful in true asthma, but during the attack an emetic of ipecacuanha wine, the warm bath, and diluted mustard poultice to the chest, and the administration of a stimulating antispasmodic medicine (7) should be employed. If relief do not soon come, begin the iodide of potassium mixture (1), giving the first three doses at intervals of only two hours.

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Children affected with asthma are coddled in a way which often inflicts permanent injury. They are swaddled up in an appalling amount of clothing, and restricted to the house except during very limited hours in fine weather. Believed to be "delicate," they are maltreated from beginning to end, and compelled to be delicate. The true fact is that the nervous system is chiefly at fault, and our endeavour should be to build it up by invigorating surroundings and rational treatment. For this reason plenty of fresh air, outdoor games aud occupations should always be recommended. In many instances some error in diet is liable to start an attack. The asthmatic child should therefore always be fed on plain and wholesome diet. Asthma is more distressing than dangerous. Various remedies are employed in different cases—the more successful of these are the fumes of Nitre papers or of powders, Stramonium, or Himrod's cure. When an attack threatens, it is as well to give a saline aperient at once and commence with iodide of potassium and ethereal tincture of lobelia. A hypodermic injection of morphia one-twelfth of a grain for a child six years old sometimes gives speedy relief. Arsenic is an excellent tonic in asthma and should be given for a long period with occasional intervals.

Heart cases.

About heart affections in children, parents need not be nearly so apprehensive as is legitimate when the sufferer is an adult, but a physician alone can decide the nature and gravity of a case.

DIVISION V.—AFFECTIONS OF THE BOWELS.

CHAPTER XXXII.

CONSTIPATION.

CONSTIPATION is one of the minor ailments of infants and older children which is very frequently met with; it is in most cases due either to lack of tone in the bowels or to dietetic errors, that is, the nourishment may be of defective quality or of unsuitable composition. For instance, if the milk be too watery, it may be fully digested, but the motions will be small and infrequent. Similarly if the quantity be deficient, there is little likelihood of a motion at regular periods. But discounting the above, the commonest causes in this country are a deficiency of fat in the nourishment or a too frequent use of the starchy foods which we have before spoken of.

Frequent in India.

The first fact which it is very desirable to bear in mind is this, that as diarrhœa always represents a danger, constipation is a condition which we can afford comparatively to ignore. It is seldom important, except when occurring as a symptom of head affections.

Significance.

The symptoms associated with any degree of chronic constipation are many. The child may be brought to the doctor for flatulence, colic, restlessness or wasting; there may be occasional vomiting and the abdomen may be distended, sometimes there is a tendency to prolapse of the rectum or hernia from the straining

General symptoms.

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efforts at stool. If the condition occurs later, for instance, after the age of three. The symptoms are usually well marked, the child is languid, his complexion muddy, his breath and tongue foul and the stools hard and scanty. The bowels do not act with regularity. The motions are almost always too light in colour, because the solidity of the mass has not permitted the penetration of the bile. Sometimes the motions may be partially fluid, that is, we may have hard lumps ejected forcibly in the midst of coloured water ; the lumps having then acted as an irritant, and caused increased exudation from the intestine. Not infrequently a few drops of blood may be passed at the end of a hard motion, but this need not occasion any alarm. It is due to the forcing having ruptured one of the very minute and delicate veins near the orifice, and it is not of the slightest consequence, being very different in significance from a dysenteric stool.

Treatment.

It is only by understanding the cause of a case of constipation that we can hope to treat it successfully.

. Infants at breast.

1. In infants at the breast constipation is common. The child is in good health, there is simply infrequency and hardness of the motions. During the first two months of life constipation is as common as diarrhœa is rare. The stools are more than usually white in colour : because being so hard, the bile and other colouring matters cannot penetrate them. In these cases the fault almost invariably is with the milk of the mother, who by reforming her ways, taking more exercise, and eating more vegetables, may generally effectually cure her child. It may be necessary to cause the mother to take an occasional Seidlitz powder or a dose of Epsom salt.

If bottle-fed in the early stage, adding five drops of Cod Liver Oil to each feed or giving a teaspoonful of cream in addition may be enough, but if this is insufficient it is well to prescribe 5 grains of mag. sulp. or sodium phosphate, or mag. carb.; or manna half a teaspoonful in dill water twice a day or to add 1 grain of sulphur in each bottle feed and with this the movements of the bowel should be stimulated by thorough massaging the abdomen from right to left along the course of the colon for a few minutes 2 or 3 times daily. Jacobi recommends that a piece of loaf sugar should be dissolved in tepid or oatmeal water and given before each nursing, this often proves effectual in a mild case with the child at the breast where cream and oil have failed. The prolonged use of suppositories or enemata is not to be encouraged. With the above treatment if the habit of evacuation be taught the child will soon become regular at stool.

After 9 months.

2. Occasionally after the age of six months the condition becomes chronic and troublesome, then other purgatives may be tried in order to induce a regular habit. 5 drops of tincture of aloes or liquid extract of cascara may be combined with 10 drops of the syrup of senna in dill water, or if the motions are putty like, 2 drops of tincture of podophyllin may be given. If there is any flatulence or heartburn a useful combination is magnesium sulphate 5 grains, sod. bicarb, 5 grains, sp. ether nitrosi 5 drops, fluid magnesia and dill water of each one teaspoonful. Dose one or two teaspoonfuls three times daily.

3. For older children it must be distinctly understood that the only merit in laxatives or purgatives is that they are given with the one idea of setting up a regular habit; if need be they may be continued for a month until the tone of the bowel is restored and a

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habit established. A child should be taught to go to the closet regularly at a fixed time daily and this routine if persisted in will be of life-long benefit. There are many useful laxatives for this purpose.

Confection of sulphur, at night, or sodium sulphate on rising; or cascara sagrada, or nux vomica in combination with belladonna and aloin are amongst the best. In this country one of the most effectual in that it is procurable in the bazar is to obtain some senna pods, soak two or three in a half tumbler of sodawater over night and drink the infusion on rising or after soaking for 6—8 hours it may be drunk at bed-time. We have dealt with this subject at length partly because of its importance later to the child's welfare and partly because of its frequency in this country, but before concluding it is most necessary to remind the parent that laxatives are but a small portion of the treatment. A regular habit must be aided by a regular and proper diet. In the tropics fluid readily leaves the body by the sweat glands. The child therefore should drink copiously and if possible between meals, the diet should be simple with the avoidance of seasoned or hot dishes, pastry and sweets should be allowed only in moderation, but vegetable and fruit-eating be encouraged. Bananas, oranges, papya, etc., are usually readily procurable at any time and may be given. Oatmeal porridge is helpful.

MUCOUS DISEASE.

It is well to describe here a condition of chronic gastro-intestinal catarrh which would appear to be almost an intermediate state between morbid constipation and diarrhœa in childhood. We refer to mucous disease which was first described by Dr. Eustace Smith and which we have frequently seen in this country.

In this disease, the mother will relate that her child is constipated or has attacks of diarrhœa, accompanied by what she may call a bilious attack of vomiting and abdominal pain and in both conditions the stools are smeared with slimy mucus. She will probably say that the child is languid and peevish, and that she has suspected and treated her for worms. The appetite she will tell you is perhaps poor, or it may be voracious and yet the child does not gain flesh, and is ailing. Very often you will get a history of cough and wasting and you will suspect phthisis, but the cough is due to gastric irritation and the wasting to the condition of the mucous membrane which is unable to assimilate food. In other cases there may be a history of passing undigested stools shortly after food (Lienteria), or of incontinence of urine, or of a liking for abnormal articles of food. In most cases the tongue is a guide, for you will find that it is pale and flabby and has a glazed appearance as if it had been painted over with gum.

Symptoms.

Treatment in the main consists in careful attention to the diet, vegetables, sugar, all sweets of any kind, and all starchy food must be strictly forbidden. The feeds must be regular with nothing between meals, eggs, meat, milk, stale bread, dry toast, and fish may be allowed.

Treatment.

Medicine should be alkaline and tonic, a good prescription would be: Potas. Citras gr. 5, Pot. Bicarb. gr. 5, Ferri et Amon. Cit. gr. 5, Infusion of Gentian ½ oz., one tablespoonful three times a day: and if there be pain 5 grains of Potas. Bromide may be added.

The bowels should be regulated. Dr. Hutchinson recommends a mixture of one teaspoon of vinum ferri and one teaspoon of decoction of aloes after

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CHAPTER XXXIII.

DIARRHŒA.

Frequently mismanaged.

We now come to speak of an affection the existence of which is at once recognised even by the most unskilled, but which nevertheless is in great number of cases popularly mismanaged. That there is an unnatural flux is self-evident, and it is the frequency and watery consistency of the evacuations which is the chief characteristic of diarrhœa ; and with this knowledge occurs but the single prevailing idea—the use of astringents. Now, it cannot be too clearly understood that this notion may often prove to be a disastrous one. Astringents exclusively will, oftener than not, aggravate the complaint, or very possibly convert an easily managed diarrhœa into a severe inflammatory affection.

A state of diarrhœa is one the existence of which we should never ignore ; it always represents danger. The disease is very common and is often the scourge of infant life. It is the most fatal of all the diseases with which the young child has to contend in India. Even in England diarrhœa ranks third as a cause of the deaths of children under five years of age.

Let it be a maxim that children's diarrhœa in India should always be treated whatever be its nature or whenever it occurs. Heed not the advice to allow diarrhœa to progress while teething is going on. Firmly take your stand, and act upon the opposite principle ; more particularly in the case of chronic

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diarrhœa, that form of the disorder in which temporising is popularly most commended. It is not desirable to induce actual constipation when dentition is in progress; but do not for a moment believe that constipation, even during teething, is the fatal thing it is represented to be, or that it is a state fraught with all the dangers of convulsions. It is through diarrhœa rather than constipation that we court convulsions when the child is teething.

Diarrhœa may be produced by almost innumerable causes—bacterial or otherwise. No doubt (1) errors in diet are by far the most frequent. (2) Dentition is popularly supposed to be a very prolific cause, but we believe the assertion to be far from the fact. No doubt diarrhœa is most common between the ages of six months and two years, that is, within the period of active dentition and when faults in dietary are most rife; but the intestines are, at the same time, undergoing a stage of development, which renders them peculiarly intolerant of irritation. The susceptibility is, it is true, greater; and in delicate children, dentition may accelerate a diarrhœa, but it is a natural process, which does not give rise to disease in the healthy. (3) Atmospheric conditions, such as the damp and cold of the rains and sudden vicissitudes, as undoubted causes may affect the child itself directly, or indirectly through its food.

Mr. Turner, of Portsmouth, writes:—"Given a certain percentage of infants in a town who receive other nourishment than breast milk, the annual state of the town being the same, the mortality from diarrhœa will be entirely ruled by meteorological conditions. It is not so much the effect of the temperature on the infant itself which influences the mortality—indeed, it is very rarely fatal to the child nourished upon human milk;

but it is the influence of the temperature on the child's food which determines in the highest degree the number of deaths.

(4) A polluted air, such as may be caused by want of drainage, foul surfaces, or water-closets, is another cause. (5) Worms are an occasional cause ; and (6) Malarial infection certainly produces it. (7) Fermentation set up in food and milk by germs, which are frequently conveyed on the legs of flies.

Treatment.

The causes chiefly affect the question of diarrhœa as indicating the proper measures for prevention, but so far as treatment is concerned adhering to the practical view of the matter, it is rather by the nature of the stools and symptoms, indicating as they do faithfully the internal condition of the intestine, that we must be guided. Even if it were otherwise, the cause is often difficult of discovery. It is all very well to talk of "removing the cause," but it is often very impracticable advice. Always bear in mind that children do not require heroic and energetic treatment with drugs. For little ailments let Nature take its course. Never dose a child with medicine for trivial complaints. A dose of castor oil will brighten up a languid and listless child, whereas any indiscriminate administration of strong medicine will only upset it.

Classification.

Various classifications have been suggested, but from a clinical point of view it may be divided into :—

I. (*a*) Simple or acute diarrhœa.
   (*b*) Choleraic diarrhœa.
   (*c*) Febrile or inflammatory diarrhœa.
II. Chronic diarrhœa.
III. Acute diarrhœa.

Dietetic errors.—Overfeeding and improper feeding are perhaps the main causes of simple diarrhœa. In majority of cases it is due to bacterial infection.

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Diarrhœa is more common in hand-fed than breast-fed infants. The infection may be conveyed by milk which is anything but a germ free fluid ; in breast-fed infants the infection may be carried through the air. Chills and dentition may also be the exciting causes of simple diarrhœa in many cases.

The stools are offensive, frothy, of a greenish colour and mixed with curds of undigested food. Sometimes the evacuations are bright yellow, at times pale. Vomiting may or may not be present, occasionally milk is vomited undigested in curds. The negative symptoms and appearances are, however, just as important ; there is no fever (unless the diarrhœa be a mere symptom of a fever), the motions are not scanty, nor are they like curd or pap thrown into discoloured water.

Treatment.

Treatment of Acute Diarrhœa.—Starvation and elimination, according to Hutchison, should be the watchwords in the treatment of acute diarrhœa. "You must starve the child because you do not wish to furnish any further pabulum for the growth of micro-organisms ; and milk in particular you must withhold, for there is reason to believe that milk in such cases is actually poisonous. With regard to elimination, your idea should be, in the first place, to remove as far as you can those organisms which are still growing in the alimentary canal, and in the second place, to get rid of their poisons" (Hutchison). In the treatment of diarrhœa astringents are not only useless but positively harmful. Castor oil emulsion or equal parts of castor oil and lime water every two or three hours, until the stools become healthy, is a most valuable prescription. This must be combined with appropriate diet. Milk, if given at all, must be sterilised and diluted with lime water. Milk and

barley water would only supply a suitable medium where micro-organisms may thrive. Whey and albumen water not only supply nourishment but also stop vomiting. In mild cases castor oil followed by bismuth, soda and cinnamon or small doses of hyd. creta will effect a cure.

Administration of opium to children.—Never give opium at the onset of the illness. It is always advisable to remove the source of irritation by aperients. Calomel and Dover's powder ⅛ gr. of each may be given with advantage. Opium is indicated to stop the excessive peristalsis. Food is sometimes hurried on before it can be properly digested and absorbed. One drop of tinct. of opium may be given in such cases if necessary. But always remember that children are very susceptible to opium. "Never wake up a child to give a dose of opium. The child will sleep off an overdose of opium if you will let him." Administration of Opium.

(*b*) *Choleraic Diarrhœa.*

Violent watery or choleraic diarrhœa is, fortunately, not very common. From six months to two years of age is the most usual period of occurrence. The onset is sudden, and often accompanied with vomiting. Frequent copious motions, which seem to consist almost altogether of greenish coloured or almost colourless water, are voided. The hands and feet become cold, the face pale, shrunken, and wizened, and the lips thin. In a few hours, in a very severe case, the child will have all the appearance of an aged person. A most important characteristic symptom is the inability of the child to sleep, or even to rest; he moans, frequently shrieks, and is never quiet a moment. The exhaustion is so rapid, by the draining away of the fluids, that a convulsion is very likely to ensue if treatment be not Choleraic Diarrhœa. Symptoms.

CHAP. XXXIII. strenuously adopted. Obviously there is not a moment to be lost.

Treatment. The objects of treatment are (1) To stop the purging, (2) to allay the nervous irritability, and (3) to sustain the vital powers.

(1) To check the purging we use gallic acid or catechu and sulphuric acid to the first dose of which (the first only) one drop of laudanum for every year of age the child has completed, should be added, none being given if the patient is under one year of age. The mixture should then, without any more opium, be administered after every motion till the purging has ceased ; or has become so checked as to be no longer dangerous.

(2) To soothe the nervous system is a matter not one degree of less importance ; and it is accomplished by bromide of potassium, which should be given every hour in conjunction with the acid mixture, till sound sleep is procured. In cases of collapse brandy is to be given, and the child should be put into a warm mustard bath or hot pack. If much fever is present, a cold pack or bath is indicated. For choleraic diarrhœa, calcium chloride is useful to check the serous exudation, by increasing the coagulability of the blood. Strong jugged soup, the juice of raw meat, and white wine whey or the brandy and egg mixture must be given at short intervals, and in small quantities at a time. In addition to these measures it is very important to inject into the bowel saline fluid of the strength of one teaspoonful of common salt to the pint of water. This can easily be done by attaching to the nozzle of the barrel, of a four-ounce glass syringe, a soft rubber No. 12 catheter. Remove the piston. Anoint the catheter with vaseline, and pass it up the back passage (the anus) as far as it will go. Fill the barrel with

the salt and water. Raise the child's buttocks and let it gravitate slowly into the bowel until a pint or more has passed. A doctor—if there is collapse—will probably inject a similar fluid into the vein of a child and by so doing may save its life.

Very likely constipation will succeed this attack. If so, do not meddle with it, but rest satisfied with a restriction to the simplest diet as the only further treatment necessary; but it will be a mistake to introduce milk or even farinaceous foods too soon.

(*c*) *Febrile or Inflammatory Diarrhœa and Dysentery.*

When properly treated in the early stages this is one of the most manageable of all illnesses, but if allowed to become chronic, it is always serious and sometimes formidable. Importance of early attention.

Here we have an inflammation commencing either in the mucous lining or glands of the bowel, the symptoms varying according to the part of the intestine attacked. The danger is that ulceration or sloughing should happen. Nature.

The modes of propagation and the prevention of these forms of bowel complaint have already been discussed. TRUE DYSENTERY is due to the presence of a microscopic living, single-celled organism known as the amœba coli, and it enters the alimentary canal by the drinking-water. It should ever be remembered that the effluvium from dysenteric stools may propagate the disease, wherefore it should be a strict rule to remove all such from the house immediately, and it is a good plan also to disinfect the motions as soon as passed. Propagation.

As to the prospects of a case, all depends upon the stage at which treatment has been commenced. If ulceration has had time to become firmly established,

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the case is always critical. If it be otherwise, a rapid recovery, under proper treatment, may with confidence be predicted. Real dysentery is extremely rare during early childhood.

Symptoms.

An attack is accompanied by some fever, and it may commence in one of two ways—either as a violent fluid purging, at first of a curdy nature, or as a griping diarrhœa with straining and scanty motions. In the first kind the evacuations soon become much less copious, but more or less slimy and tinged with blood, while curdy substances float upon the surface, the symptoms merging into those of the second kind. In either case the child looks pale and worn, but his attention is easily attracted. He is thirsty and languid, and the tongue, which was at first moist, soon becomes red and dry. The bowels act with increasing frequency, but with diminishing results, till after a time almost nothing but bloody slime is voided, and that with great pain and straining. Ordinary fæcal matter is either absent altogether or almost entirely so. Shreddy mucous and blood compose, or nearly compose, the whole stool, which has a very peculiar fœtid sickly odour, pressure over the lower part of the belly may cause pain. The amount of straining is in proportion to the proximity of the mischief to the lower end of the intestine, and the griping and abdominal pain bear a ratio to the intensity of the disease. Improvement is first intimated by the reappearance of fæcal matter in the stools, and by marked mitigation of the straining and pain.

Treatment.

It is of great importance to treat these cases judiciously from the beginning. Astringents must very rarely be employed. This class of drugs only increase the inflammation, by confining the acrid secretions within the intestine, where they undergo decomposition,

distending the belly with gas and producing great pain and misery. CHAP. XXXIII.

We must commence our treatment by clearing out the bowels of all offending matter, for which purpose castor oil is to be preferred; and then preventing the further ingress of food not capable of ready absorption. The child should preferably be kept on white of egg, whey, barley water and chicken broth. Absolute rest to the inflamed part must be maintained by keeping the patient at rest in bed. Castor oil. Diet. Rest.

Particular attention should be given to preserving the warmth of the abdomen by using the flannel binder constantly. Sufficient time having elapsed to allow of the action of the purgative, an interval of marked relief is sure to succeed. This is the period for the next step, which is to administer perseveringly the castor oil emulsion, a medicine which, simple though it be, is nothing short of a specific when properly used, that is, persistently, in very small doses and frequently repeated. This is really the secret of success (castor oil alone will not succeed; it must be emulsified). Half a teaspoonful every second hour, lengthening the interval as improvement manifests itself, is the usual dose, and the medicine should be continued for days. Abdominal warmth.

It is indeed rarely that a case will resist this treatment, of which it is impossible to speak too highly. In a couple of days or less the motions will lose their slimy, bloody, and curdy appearance, and only a little looseness remaining, the case is resolved into one of the simplest form of diarrhœa, which may need a dose or two of bismuth or of an astringent, though the parent should be reluctant to employ these drugs at all, for the reasons above given. Small doses of sulphate of magnesia may be given at the Sulphate of magnesia.

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commencement of the disease till there is no more blood and mucus in the stools. We have found the extract of koorchi (made by Smith, Stanistreet and Co., of Calcutta) very valuable in the later stages of the so-called dysentery of children, after the castor oil has relieved the bowel of its irritant contents. The dose for a child of six is two grains twice or three times a day.

Ipecacuanha.

With these drugs, properly used and properly supported by an efficient diet, it will almost never be necessary to resort to ipecacuanha, a drug which children tolerate very badly. If given at all, such small doses have to be adopted that its physiological effect can scarcely be hoped for. One-tenth to one-eighth of a grain in water and mucilage with a few grains of Aromatic Chalk Powder will be as much as a child will bear at each dose, which should be repeated as often as possible without inducing vomiting. Ipecacuanha, when resorted to, should be given at as great a distance from meals as possible, and it is a good plan to administer a single dose of laudanum (a drop for each year of age) once a day while the child is taking the drug, the largest possible dose of the ipecacuanha (as much as four to six grains may with these precautions be sometimes retained) being given about an hour after the laudanum, also selecting, if possible, the time when the child usually sleeps. If the drug is retained for an hour or more, it will have had time to affect the system. The necessary use of laudanum is an objection to the ipecacuanha treatment; however, again we repeat that it is very seldom necessary to resort to it for any of the bowel complaints of children. It must not be thought from these remarks that the writer undervalues ipecacuanha in the treatment of dysentery. Here the

so-called dysentery of children is the subject and not the specific dysentery of elder people, for which ipecacuanha is invaluable. The child is incapable of exerting that self-control which is essential to the retention of ipecacuanha. The enema is too uncertain a means of introducing ipecacuanha into the system, but it sometimes acts favourably, and may be tried under circumstances of difficulty as regards other drugs.

Turpentine stupes to the abdomen, in the event of much pain, will be found to produce wonderful relief. Stupes.

When the stools have become fœculent and quite destitute of blood, mucus, or slime, the chalk mixture with catechu may be used to moderate the remaining looseness ; but there should be no hurry in resorting to the astringents. While a diarrhœa is accompanied by a high temperature, the use of astringents is generally useless or hurtful.

Bael fruit is very commonly used in India for the treatment of diarrhœa and dysentery. The unripe fruit is astringent, while the pulp of the ripe fruit is an aperient. The unripe pulp roasted or a decoction made from the unripe slices dried in the sun, possesses more astringent property than the fresh fruit, and is therefore more efficient in mucous diarrhœa and acute dysentery. Bael fruit.

Pepsine should be used for some time subsequently to assist the weakened digestion.

CHAPTER XXXIV.

CHRONIC DIARRHŒA.

INFLAMMATION WITHIN THE ABDOMEN.

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Very serious in young children.

WHEN chronic diarrhœa becomes firmly established during the first two years of life, it is difficult of arrest. Even when checked, a long time is required to restore the intestines to proper working order. In older children it is less serious and more easily managed.

Causes.

Drs. Goodhart and Still, writing on this subject, say that chronic diarrhœa occurs for the most part in the ill-kept children of the poor of large towns; in infants whose mothers are probably out at work all day, and who are consequently fed indiscriminately. It is found in the unwashed and ill clothed, in fact, in all who breathe bad air, are fed on bad food and who live under conditions hygienically faulty. In the children of the well-to-do it usually results from improper feeding,—not necessarily from food intrinsically bad, but rather from such as is ill adapted to the particular case in many of the children in this class of society, the greatest care and forethought have been exercised; still there is something wrong in the food or its administration.

Symptoms.

The case may have commenced in many ways: when firmly established, the child becomes thin and pale, but he is tolerably lively, and he takes his food fairly well. The motions, of a pale colour and a putty-like consistence, are voided four or five times a day or oftener, with pain and straining. As time passes, the child's condition will vary; sometimes he is much better for a

day or so, sometimes he is worse. On the whole, things do not go on satisfactorily, and the motions gradually become more frequent; at times they may be like mere dirty water, and then again they may change to a mud-like substance. The child wastes, he becomes paler, and the skin assumes an earthy tint. He lolls about, lying down frequently, and he soon wears the aspect of an old man if things continue to go on badly. The motions may now become like chopped spinach and contain much slime, and sometimes a few drops of blood, due to the straining. If recovery is to take place, the first intimation of improvement will be the appearance of bile in the motions, which, as the bile increases, will become less offensive.

The motions.

In the chronic diarrhœa of children the temperature should be accurately measured by the thermometer for a few days. If the temperature be above that of health, and it remain so day after day, we may fear some fixed disease has become established. If the contrary is the case, the temperature being at or a little below the standard of health, a more hopeful view is justified.

Chronic diarrhœa is always serious, and the more so the younger the child. When it occurs as a sequel to other affections, as measles, scarlatina, etc., the case is anxious. The thicker the stools the more hopeful the case, no matter how offensive the motions may be. It is always a favourable sign if dentition continue to proceed naturally; if a great impression has been made upon the constitution, teething will be suspended.

Treatment.

In the treatment of this affection scrupulous attention to hygienic conditions is a matter of the greatest importance, beside which drug-giving is quite a secondary consideration. An equable temperature, free ventilation night and day, warm flannel clothing, especially around the abdomen, and very careful regulation of the

The food.

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diet, all of which matters have been previously discussed, are to be carefully attended to; moreover the sucking of comfortors, teething rings, etc., should be absolutely prevented. If the child be very young, the quantity of milk should either be greatly restricted or *milk should be altogether excluded from the dietary for* 24 *to* 48 *hours*, and in its place non-fermentable foods substituted, such as chicken broth, whey with cream, albumen water or barley water. Large quantities of food should never be given at once; the more severe the purging, the smaller and more frequent should be the amount of fluid given. Copious drinks should be forbidden. Even for older children, those nearly a year old, only very small quantities of farinaceous foods are allowable and the administration of patent foods should be stopped, or if adhered to, they should only be very sparingly allowed with the addition of whey, or albumen water.

Milk *per se* should be stopped completely for a time. Children who are still older should not be allowed to touch such easily fermentable articles as potatoes, sweet biscuits, and farinaceous matter generally, sugar, jams, etc.; but toasted bread with milk, fresh broths, a little fresh shredded meat, and custard pudding may be allowed. White wine whey is useful where there is exhaustion, or for older children we may then use the brandy and egg mixture. (Eustace Smith). Raw meat juice is another very useful article of diet in these cases, or we may use the raw meat itself (*see* receipt 7).

Peptonised milk.

In peptonised milk (receipt 9) we have lately been furnished with a valuable and safe means of nourishing the cases. An endeavour should always be made to induce the child to accept it.

Lime water.

Marked improvement sometimes follows the omission of lime water from the food of infants, and the

substitution for it of the gelatine solution (receipt 4). The lime water occasionally seems to irritate the mucous membrane.

Baths.

Great benefit will always be derived from the daily, or more frequent, use of the hot bath, followed by an inunction of oil; or the mustard bath may be employed when dealing with the exhaustion of older children.

Mustard poultices.

Abdominal griping and tenderness will be greatly relieved by poultices to which mustard has been added, or by turpentine fomentations. In every case enormous benefit results from giving once or twice daily a rectal wash. Only a soft small tube should be employed, and the amount injected at a time, be not more than 2 or 3 ounces, warm plain water or salt solution, one teaspoon of common salt to the pint are very efficient; after the wash 2 ounces should be injected and made to retain by elevating and squeezing the buttocks together.

Medicines. If seen early.

If the case be seen sufficiently early the stools will possess all the characteristics of those of the curdy diarrhœa of irritation; and the symptoms, too, will be much the same, except that they are of a chronic nature. We then commence treatment as before, with a short course of the red mixture (49) or still better Castor oil emulsion, made by mixing $1\frac{1}{2}$ teaspoons of Castor oil. One teaspoon of Tincture of rhubarb, a little Mucilage of acacia and an ounce of Dill water, one teaspoonful to be given every four hours for a few days only. A useful combination in a severe case after the initial Castor oil emulsion or red mixture is to give a grain of exsiccated Sulphate of Iron with a grain of Dover's powder and 4 grains of Bismuth salicylate every four hours. We have spoken previously of the danger of giving children opium. However, one-quarter of a drop of the Tincture for every four months of life may be given with safety and great benefit at times.

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Dover's powder from one to two grains is also very useful, and combined with a $\frac{1}{6}$ grain of Calomel and five grains of Bismuth is a good treatment in the early stages of diarrhœa.

Occasionally great benefit results from the trial empirical or otherwise of Santonin, given in 2 grain doses on three alternate evenings. We have also had good results from ordering silver nitrate grain $\frac{1}{6}$, glycerine one drachm, distilled water $\frac{1}{2}$ ounce ; two teaspoonfuls given every four hours for three days. As improvement takes place, medicine may be omitted and Bael fruit (33) used instead.

When signs of inflammation appear.

Should, however, the looseness, now reduced to simple diarrhœa, still continue, we must resort to pure astringents (29).

If, on the other hand, the motions have already become scanty, shreddy, of very offensive odour, and contain blood, we must avoid astringents, and use the castor oil emulsion (51) with aromatics, such as powdered cinnamon and carraway, persistently until the symptoms yield : an astringent not being substituted until the tongue has become clean, and the motions reduced, for some days, to the nature of those of a simple diarrhœa. The oxide of zinc (34) often answers admirably, sometimes even better than the emulsion, in these circumstances. Astringents should be absolutely avoided so long as the temperature of the body is high.

Fermented motion.

When the motions are large, fermented and putty-like, a bismuth (5 grains) and salicin (2 grains) powder after every meal will be found most useful ; while, at the same time, an occasional dose of No. 7 may with advantage be given.

Medicine in convalescence.

A cure having been effected, the greatest precautions as to diet, clothing, exercise, etc., must be adopted for some time, a relapse being very easily induced.

During the period of convalescence, iron in the form of the "*Liquor Ferri Pernitratis*," as obtainable from the druggist, in doses of five drops three times a day, in half a wineglassful of water, after food, is a valuable medicine for older children.

Recovery gradual.

A sudden improvement should not be expected to follow treatment. That any degree of amendment is daily observable ought to satisfy the most sanguine. The mischief which weeks of disease has accomplished cannot be remedied without time.

INFLAMMATION WITHIN THE ABDOMEN.

Description.

By this it is intended to signify the inflammations known as peritonitis, appendicitis, etc. We have pain, tenderness and swelling (either local or general) of the abdomen, with constipation and vomiting, and usually, but not always at the early stage, fever. The painful condition of the abdomen is the predominant symptom ; it cannot fail to attract early attention, and give the clue to the nature of the case. If the pain and swelling be localised, they will probably be discovered usually just above the right groin, and the patient will lie on his back with the leg of that side drawn up : any attempt to straighten it is attended with severe pain.

Management.

These cases are mentioned here chiefly with the object of preventing the parent mistaking them for instances of constipation (under which heading allusion has been made to this point), and committing the error of treating them accordingly. Purgatives should not be administered ; they would do harm. *Professional aid should be summoned.* The parent herself can only adopt a treatment of absolute rest, a scanty fluid diet of strong soups and diluted milk, with perhaps the yolk of a raw egg beaten up with the latter, poulticing the abdomen with turpentine stupes, and the administration

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of small doses of opium (*see* Opium), either as Dover's powder or laudanum, just sufficient to create a slight degree of drowsiness and relieve the pain. If, however, all these measures be carried out, it means that a great deal has been done. Very frequently it will be found that some accident, such as a fall or a blow, has been the cause of the inflammation, but chills may also produce it.

Inversion of intestine.

An inversion of a portion of intestine back within itself is another very serious condition which requires an exactly similar management and early professional aid. It is best that the parent should attempt no more. The symptoms are so similar that it is needless to attempt their description, but it may be mentioned that straining with the ejection of bloody mucus is prominent.

CHAPTER XXXV.

PROTRUSION OF THE BOWEL.

COLIC AND FLATULENCE.

Causes.

In long-continued bowel complaints, and indeed sometimes without such disease, in delicate children, the bowel may protrude from the fundament at each evacuation. Habitual constipation in weakly children who are allowed to strain much at stool is another cause, and the irritation of worms is not infrequently associated with prolapse. Also the need for circumcision in male children is often a cause.

Recognition.

The condition cannot be mistaken when observed, and it is not likely to remain long concealed, in consequence of the pain occasioned by it. The inverted gut will be seen to protrude, as a purplish-red, thick ring, from the fundament.

Importance.

There exists no cause for alarm. Reduction may be readily effected, and complete relief thus given. On the other hand, to allow the protrusion to remain unreduced for any length of time would be to incur a risk, because the pressure of the edge of the fundament might strangle it and cause gangrene of the prolapsed part.

How to reduce it.

Having thoroughly lubricated the surface with sweet oil, the protrusion, protected by a handkerchief, should be grasped with the points of the fingers, steadily squeezed for about half a minute to empty it of blood, and then pressed towards the body. After a few moments of such pressure, the prolapse will slip out of sight. The child should be kept lying down on its side

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Recurrence.

for some time subsequently, and should there be a tendency to strain, or there be recurrence, the buttocks after the reposition should be strapped together with a piece of firm sticking plaster such as Meads and an injection as below given twice a day.

Prevention.

Prevention is the proper treatment. The constipation, the diarrhœa, or the debility being removed, and the general health re-established, the accident will cease to happen. But to accomplish this end time is required. In the meanwhile the child should not be permitted to sit long at stool ; indeed, it may be necessary to prohibit the sitting posture wholly, the patient being taught to evacuate his motions upon a napkin or sheet placed under him.

Other measures.

In addition to the above measures, in a case of persistent protrusion, a couple of ounces of cold water, in which six or eight grains of sulphate of iron (obtainable in the bazaar as Heera-Kusees) have been dissolved, should be injected into the bowel, twice a day ; and the solution of pernitrate of iron (p. 305), or prescription 68, administered internally.

COLIC AND FLATULENCE.

Really a symptom.

This condition is more of the nature of a symptom than a sickness. It consists of a spasmodic pain or griping of the intestine. When an infant screams and draws up its legs, and is free from fever, the hands and feet being rather cold than otherwise, it is probably griped or affected with colic. The stomach is usually distended and hard—possibly there may be vomiting, and a greenish motion or two may be passed.

Causes.

Flatulence with or without colic is one of the commonest accompaniments of indigestion, due to excess of food or errors in the diet of the infant, or to some indiscretion on the part of a nursing mother. The

gases evolved from the undigested food distend the intestine and produce pain. If the child be at the breast, the symptoms may be entirely due to poorness or insufficiency of the mother's milk; if this is so or there is even suspicion of such, it is best to let the mother only feed the child by night and to rear the child by day according to the plans given earlier in the book. Indeed it is often best to early accept the inevitable and to start hand feeding altogether, if there is reason to think from examination of the child and the breasts of the mother that her milk is poor in quality and quantity. If the child is being hand fed and the symptoms arise, and from an examination of history of the stools undigestibility of the food is suspected, the flatulent colic can be prevented by further diluting the milk for a short time, or by paying scrupulous attention to its preparation, or by adding an alkali such as lime water, bicarbonate of soda, or sodium citrate or perhaps by peptonizing the milk for a short time.

Treatment.

The first thing to be done in a case is to administer ten drops of the sweet spirits of nitre in a teaspoonful of carraway or aniseed water; or to give a dose of prescription 7. In a few minutes an eructation of wind will follow this draught, the flow of urine after a short time will be increased, and the distress will cease temporarily. A dose of castor oil (48), or perhaps better a teaspoonful of salad oil, should then be given. Either of these had better be aided in their action by an asafœtida enema or by the simple injection of 3 ounces of warm water. The warm bath, followed by bran poultices to the stomach, or rubbing the abdomen with warm oil, will much aid in hastening relief. The hands and feet of the child must be kept warm and wrapped up, and if the colic is severe, placing

CHAP. XXXV. the infant in a mustard bath. Until the arms of the holder tingle, often greatly benefits the child. Should these means not give complete relief, a mixture composed of forty grains of bicarbonate of soda, half a drachm of sal volatile, and two ounces of carraway water should be made, and two teaspoonfuls of it given every second hour.

Diet. So much having been accomplished, we should set about rectifying the diet, which, in any case, for a few days following, should be of the simplest nature.

CHAPTER XXXVI.

CHOLERA.

THIS terrible disease is very unusual among children under one year of age, but as the child grows older the liability to cholera gradually increases (p. 128). Age.

Concerning the mode of origin of cholera, the means of prevention and disinfection, the reader is referred to a previous chapter. Causes, etc.

There may be some premonitory diarrhœa Soon, vomiting and purging of a material closely resembling rice-water in appearance, supervenes. The vomiting varies greatly in its intensity in different cases, but the purging always sets in and continues with great intensity. Shortly afterwards succeeds coldness of the limbs, and frequently cramps of the muscles, a feeble pulse, coldness and lividity of the lips, cold tongue and breath. The eyes are sunken, the breathing difficult and oppressed, restlessness is intense, and thirst unquenchable. No urine is secreted. A cold, clammy perspiration covers the body. The whole appearance is appalling, the voice is lost altogether, and the pulse ceases to be perceptible at the wrist. Symptoms.

The only affection which at all resembles cholera is the violent watery diarrhœa, which has been already described. The resemblance may sometimes be close between the two, but the stools of the latter do not resemble rice-water ; they are greenish. The clammy perspiration of collapse does not occur. Vomiting is not persistent, if it occurs at all, and the pulse is never wholly absent as it is in cholera, nor Distinction.

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is the urine wholly suppressed. The breathing is oppressed in cholera, but free in diarrhœa. The lividity of cholera is supplanted by pallor in diarrhœa. Watery diarrhœa is well known in England, whereas cholera is unknown there except at long intervals and in brief epidemics. We have cramps in cholera, none in diarrhœa. Convulsions seldom terminate a cholera case, whereas when watery diarrhœa ends fatally it is usually by convulsions. The issue is hopeful in diarrhœa, whereas the contrary holds of cholera. But if in the early stage there is confusion between the two, as may be, no harm is done, the treatment of one condition being applicable to the other.

Treatment.

Happily the treatment of cholera is far more satisfactory now than it has ever hitherto been. This in very large measure is due to the research work of Major Rogers, I.M.S., who, as the result of his investigations and treatment, has brought the death-rate from 80 per cent. down to only 30 per cent.* The medical reader must be referred to his book for full details. Here we may epitomise the scheme of treatment, which is applicable in any case. If there is restlessness, cyanosis, or cramps, or if the pulse be very small and feeble, at once give an intravenous injection of a hypertonic saline solution. The solution consists of the chlorides of sodium, potassium, and calcium in water and can be obtained in Tabloids by Burroughs and Wellcome of such strength that 4 tabloids to the pint of plain water make a correct solution. The quantity injected should be from 2 to 4 pints which may be repeated later if necessary. The temperature of the solution should be about 100° Fahr. If this solution be not obtainable, use

* Cholera and its Treatment. By Major Rogers, C.I.E., M.D., F.R.C.S., I.M.S., published by Oxford University Press. Price Rs. 6.

boiled water to which 2 teaspoons of common salt are added to the pint. The vein should be chosen at the bend of the elbow, or on the inner side of the foot. If apparatus be not available, do not delay but inject either under the skin into the rectum or into the peritoneal cavity, but none of these latter ways compare with the intravenous method.

The child should be allowed to drink copiously but in small quantities by the mouth. In cholera an enormous quantity of fluid is leaving the body, therefore it is essential that this loss should be met as far as possible by the child drinking or absorbing by bowel or vein. Weak lemonade, coffee, or plain water should be given frequently in small quantities despite vomiting.

As regards medicines, it must be thoroughly understood that *opium in any form must never be given.* Major Rogers has conclusively proved that morphine or opium is absolutely injurious in cholera once the typical evacuations have set in ; morphine should never be given for the cramps. Saline given as above will relieve them. To give morphia or opium is to imperil the life of a patient old or young.

As regards drugs in cholera Major Rogers has proved that the only drug that is of imperative value is potassium or calcium permanganate. The child should be given a solution of one of these drugs one, two or three grains to the pint of water and be allowed to drink an ounce every half hour or hour in the acute stages until the motions become greenish in colour, or if they are procurable in pill form. A pill of one grain of potas permanganate may be given for a similar period. The value of these drugs lies in the fact that they destroy by oxidation the poisons of the cholera germ. The pills are best procured ready made up by Burroughs & Wellcome. The great

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value of this remedy in cholera is that it is readily performed by the parent as potas permanganate can be always procured. During the treatment by pill or solution only barley water should be given, milk and soups are to be stopped. On the second day, the drug should be again given either four-hourly or every half hour for four hours only. In a severe case it may be necessary on the third day also.

Should the child by the above measures show signs of recovery, the stage of reaction must be carefully watched. The temperature very often becomes very high and will need control by the means we have already mentioned in a previous chapter. The heart will perhaps need stimulation with small doses of sal volatile, digitalis or nux vomica, and the diet will have to be carefully scrutinised ; nothing in the shape of animal food, milk, jellies or soups should be given. Whey, arrowroot, barley water, and cornflour are best continued for three or four days after symptoms have become less.

We have seen then that this treatment of salines and permanganate which has so revolutionised the results in cholera can be readily and rapidly carried out at extremely small cost. The apparatus for intravenous transfusion may be obtained from Bathgate & Co. or Smith, Stanistreet, Calcutta, for 15 rupees.

Prevention of spreading.

Note.—If all the precautions previously mentioned regarding the disinfection of the stools, the room, the bedding, etc., be adopted, and other matters which have been also alluded to, attended to, no fear need be entertained that the disease will spread from the patient, either to the attendants or others.

So-called "cholera pills" and *"cholera mixtures"* are *sold very generally.* They *should never be given to children, as* they *all contain an amount of opium which would be very dangerous.*

CHAPTER XXXVII.

WORMS.

THERE are three kinds of worms which infest the intestines of children, namely, the thread-worm, the round-worm, and the tape-worm, all of which are depicted in the plate.

Description of thread-worm.

The *thread-worm* varies in size from one-sixth to one-third of an inch, or even more, in length, the male being smaller than the female. They appear as represented in Fig. 3, upon the surface of the child's motion, where they move briskly about. They reside in the lower end of the bowel : they are never found in the sucking infant, but among older children they are the most common of all kinds.

Habitat.

Description of round-worm.

The *round-worm* (Fig. 2) varies in length from four inches to a foot, the male being shorter than the female. It is smooth, of a white or pinkish colour, and its body tapers off gradually to a point at either end. These worms inhabit the commencement of the intestine. Sometimes they make their way into the stomach, and they may even be vomited from the mouth. They are most common in children between the ages of three and ten years. Perhaps only two or three may be present at the same time in the body : it is seldom that their number exceeds twenty, but sometimes many more are found.

Habitat.

Description of tape-worm.

The *tape-worm* (Fig. 1) varies in length from about ten to thirty feet, and its breadth is about one-third of an inch at its widest part. The round head, which is only about the size of the head of a pin, is provided

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with a proboscis, armed with a double row of hooklets. The neck, narrow, and only half an inch in length, is joined to the larger part of the body by a long portion as thin as the neck itself. All this intermediate length is marked with transverse lines, and the whole of the broader part of the body is divided into plainly marked segments. Each segment (being bisexual, when detached from the rest of the worm) has the power of producing fresh lengths of the parasite. A fully developed tape-worm numbers "about 1100 of these joints" (Cobbold). This worm inhabits the small intestine, or that end which is nearest to the stomach.

Wonderful reproductive powers.

Habitat.

The mode by which the various worms gain access to the body, and the precautions to be adopted to avoid their occurrence, have been already described (*see* p. 147).

General symptoms.

Not positive.

The symptoms are unsatisfactory, in that there is no sign or set of symptoms which renders it certain that worms are present. We may be led to believe by symptoms that probably these pests are in the body of a child, but ocular demonstration is the only means of certainty. One of the most constant signs is the passage of a quantity of jelly-like mucus with the motions, while at the same time the bowels are disordered and the general health is unsatisfactory. The child usually becomes pale and flabby, there are dark marks under the eyes, the breath is offensive, and nervous disturbance is manifested by restlessness at night, grinding the teeth, and startings during sleep; and by drowsiness during the daytime. There is frequently a short, dry cough: the belly is usually tumid and the appetite capricious, sometimes voracious, at others the reverse. Picking at the nose and itching of the fundament are usual. Such are the general

symptoms, which are, however, by no means positively distinctive of worms.

Symptoms special to each kind.

When there are thread-worms in the bowel, itching of the anus, picking at the nose, and straining at stool are the most frequent symptoms. The round-worm causes abdominal pain, vomiting, and nervous symptoms, which may terminate in convulsions.

The tape-worm gives rise to a sensation of "gnawing" in the belly, and to attacks of colic, a ravenous appetite, and progressive emaciation.

Examine the stools.

When there is good reason to suspect the presence of worms, the stools should be carefully examined, after the employment of an aperient medicine. If the suspicion be verified, the no less important information as to the kind of worm is also obtained by the inspection.

The folly of patent worm-medicines.

The public have an unfortunate habit of concluding that worms must be present when a child continues to fall off unaccountably, especially if his bowels be irregular and he be detected in the trivial action of picking his nose: the result being that the unhappy patient is dosed with quack nostrums, quite irrespectively of the nature of the worm, if any exist, perhaps to the great injury of health.

Must know the *kind* to attack.

Before we can properly treat a case it is essential to know the kind of worm we are to deal with: armed with this information the treatment becomes both simple and efficient.

Objects of treatment.

The objects of treatment are (1) to kill the worms, (2) to expel them, and (3) to remedy the bowel and general derangement which their presence has caused.

Treatment of thread-worms.

For the *thread-worm*, a brisk purgative (56 or 53, 54) should be given early in the morning, or if there be much bowel irritation, a dose of castor oil (48) will suffice. Throughout the day the diet should be of the

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lightest description, and in the evening a large enema (up to half a pint) of soap and warm water should be injected so as to wash the bowel thoroughly out. This having been accomplished, we should at once inject and retain for a few minutes two to four ounces of infusion of quassia, to which 15 to 30 drops of the tincture of steel or 8 to 15 grains of sulphate of iron have been added ; or, in the absence of these medicines, a teaspoonful of common salt dissolved in three or four ounces of warm water will answer the purpose (or 43). It may be necessary to repeat this treatment for two or three days running, either with or without the previous use of the purgative, as circumstances may indicate ; following it up with steel and quinine (68). In persistent cases in which this treatment fails, good results are obtained by injecting, every other night for 3 nights, a warm solution made up by adding 2 grains of santonin and 2 teaspoons of turpentine oil to 4 ounces of mucilage of starch. The itching around the fundament may be relieved by the application of a small quantity of a mixture of mercurial ("blue") ointment and glycerine of carbolic acid (1 of the acid to 4 parts of glycerine).

Treatment of round-worm.

The *round-worm* is destroyed as follows :—A dose of castor oil is to be given very early in the morning, and nothing but a scanty quantity of simple semi-liquid food allowed throughout the day. In the evening another dose of oil is to be administered. By this means the worm is laid naked, and exposed to the action of three or four grains of santonin powder, which should be given with sugar early next morning, on an empty stomach ; or the powdered santonin may be sprinkled on a small slice of bread and honey, in doses of one or two grains, twice or three times a day. A cure is frequently effected by a single dose of this drug, but the

treatment may be repeated twice or three times at intervals of a few days if the presence of more worms is suspected. The oil may be dispensed with and prescription No. 4 given in the early morning, if there has been no marked constipation, and if the diet has been regulated for twenty-four hours previously.

Peculiar effects of santonin.

Santonin causes the urine to become oily-looking and of a dark colour, and it may occasion the patient to see objects as though they were of a yellowish tint. These peculiarities of the drug are, however, of no great consequence, and they vanish when the medicine is stopped.

Treatment of tape-worm.

The *tape-worm* is, in the natural course of events, frequently expelled in portions, but as each segment which remains behind is capable of reproducing itself, it is obvious a cure is not effected till the whole worm has been expelled. The segments are always detached from the tail end, wherefore it is a good rule not to rest satisfied till the head has been voided. The head and neck are so very small (*see* Fig. 1), that unless carefully looked for, they may elude observation. Many yards may be expelled, but a case is not cured until the head has left the intestine.

Not cured till head has been expelled.

But the head is well protected.

But the head is exceedingly tenacious of its hold, and being so small, and the intestines in these cases usually containing much mucus which protects the minute head from direct assault, it is necessary, for a few days previously to the administration of the worm-destroyer, that the patient be put upon a non-farinaceous diet, from which potatoes, vegetables, pastry, and cakes should also be excluded ; meat, eggs, and milk in moderate quantities constituting almost the sole food ; very little bread, and that little toasted, being allowed. After two or three days of this food a dose of castor oil is to be given at night ; and on the following morning, as soon as the bowels have been relieved,

Must be exposed by special diet.

And castor oil.

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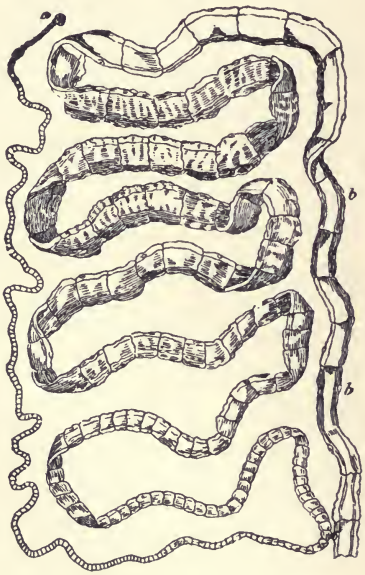
Then the male fern is given.

Oil repeated.

No food given.

twenty drops of the liquid extract of male fern (6) should be administered to a child of five or six years old. Four hours subsequently a second dose of castor oil is to be given. A very essential point is that very little, if any, food be allowed from the time the first dose of the oil has been given till the worm has been expelled, which will usually be about the middle of the following day.

Fig.1.



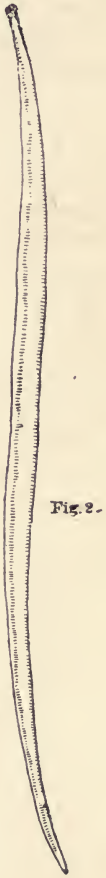


Fig.2.

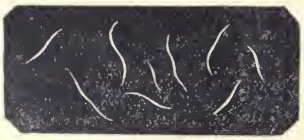


Fig.3

In the absence of the male fern extract, pomegranate may be used in the manner directed (5). The objection to its use is the large quantity of fluid required to be drunk, and the fact that griping sometimes follows its administration; still it is well to have a tolerably efficient bazaar substitute at hand.

Use pomegranate if no male fern.

Turpentine is an excellent remedy for older children. The dose should be large, two drachms for a child of six, shaken up with a little mucilage and aromatic water. Small doses of turpentine are apt to give trouble.

Turpentine.

To remedy the bowel and general derangement, we must exclude, as far as possible, starchy food for a time from the diet, especially plantains and potatoes; but the diet should be nourishing. Infusion of chiretta with a couple of grains of bicarbonate of soda in each dose will check the excessive secretion of mucus. If irritability of the bowels still remain, the castor oil emulsion (51) or the red mixture (49) may be used for a few days till regularity has become established. Tonics (such as 68, 72) may be given after all the local symptoms have subsided, with a view to the restoration of the general tone.

Subsequent management.

CHAPTER XXXVIII.

VOMITING.

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Import.

VOMITING in infants is a very common occurrence: it may be of very little significance, or it may be of most serious import. The habitual so-called vomiting of young infants soon after they have taken the breast is really not vomiting at all, but a simple emission of an unnecessary quantity.

An easy process in the child.

There is no doubt that vomiting is easier to the child than the adult; that it is accomplished with less effort, less distress, and less depression, probably because of the straighter position of the stomach.

"However, all vomiting in infants should be carefully watched. So long as it comes on early after taking food, while the quantity rejected forms but a small proportion of that taken, and the child does not suffer in any way in health, no anxiety need be felt. Should it become, however, increasingly frequent or seem to be in any way in excess, it must be taken in hand and it will be found usually amenable to treatment; if, on the other hand, it be neglected, it recurs at intervals which tend to become shorter and shorter and the child gets into a condition of grave danger."

Temporary attacks.

Slight and temporary attacks of vomiting, lasting seldom beyond a few hours, are not uncommon in young infants. More severe attacks, lasting for twelve or twenty-four hours, accompanied with feverishness and disordered bowels are also well known results of irritation; but they yield to emetics, gentle purgation, and a carefully regulated diet, the

only result being that the muscles become a little flabby. After a few days the full strength is regained.

The vomiting of indigestion is associated with a quick regular pulse and a full abdomen, and diarrhœa is often present; it has, too, a distinct relation to feeding times. The vomiting of brain affections has no relation to food; there is an irregular pulse, a retracted belly, and constipation. Vomiting ushering in an eruptive fever is uncommon, and the cause will soon declare itself. The vomiting of peritonitis or an inverted intestine is clearly secondary to the serious local condition which attracts all attention.

When chronic, is serious.

But when vomiting is persistent, when, in fact, it becomes a chronic state, accompanied by wasting and prostration, the case is to be regarded as serious in its nature.

Symptoms.

At first nothing but curdled, sour-smelling milk, mixed with bile, is ejected; but after a time only clear water is voided; the little patient's belly becomes tumid, the bowels are constipated, or alternately constipated and relaxed, the looser motions being very offensive. Fetid wind is eructated from the mouth and the belly gurgles. All food is rejected shortly after being swallowed; even the water which is so greatly craved for is vomited. The child emaciates, he becomes pinched, pale, and clay coloured, and he is cross and irritable. The skin is dry but cool, and the mouth is parched or clammy.

May become very dangerous.

A child may go on in this way for months if not attended to. He is, of course, but a shadow of his former self, but the decline may not have been so rapid as to have attracted great attention. Should the fontanelle become depressed, and the head symptoms of bloodlessness appear, the danger is great and immediate.

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Signs of recovery.

The signs of approaching recovery are lessened frequency of vomiting and restoration of the natural functions of the bowels.

Causes.

The causes of this distressing and dangerous condition are to be found in departure from the laws which should govern diet and general hygiene. Premature weaning is also a cause; overcrowding of sleeping apartments and insufficient and irritating food are others.

Value of the thermometer.

It is very important to ascertain the temperature with the thermometer, because persistent vomiting is sometimes a symptom of the approach of inflammatory diseases of the chest or brain, or of one of the eruptive fevers. In chronic vomiting, as a condition in itself, the temperature is always low, generally about 97°, whereas in inflammatory affections of course there will be some fever present.

Treatment of simpler cases.

In the simpler cases a cure may be affected by withdrawing all fermentable articles of food from the dietary.

Treatment of obstinate cases.

But should the case prove obstinate, the stools and breath continuing to smell sour, and the vomiting persisting, we must adopt more active measures. When the child is being artificially fed, a wet nurse should be immediately procured. Very frequently a cure will be thus effected. But if this cannot be done, or if the child be too old to allow the idea to be put into practice, the first thing to do is to regulate the feeding, the child is in ill-health, its stomach is irritable, perhaps inflamed, therefore before commencing any treatment it is absolutely necessary to realise that it is only by the exercise of the greatest patience and perseverance that benefit will accrue, and it is well also to remember that medicines have a subsidiary place in the treatment. In a case of chronic vomiting we advise then that for the first twenty-four hours

or more nothing be given by mouth but albumen water made by adding the whites of three eggs to a pint of warm water, stirring well and adding a pinch of salt and a teaspoonful of brandy. This may be given in very small quantities at a time. Two teaspoonfuls every half hour if necessary, so long as it is retained. If albumen water is rejected, rice water or sherry whey may be tried. Extreme patience will be necessary for success. During the first twenty hours, the only medicine that need be given is one-sixth of a grain of calomel with one grain of soda bicarbonate every three hours. After this period or a few days longer, if necessary, a start must be made on the simplest of foods, diluted and alkalinised, if necessary. Whatever be chosen, be it milk and barley, condensed, citrated or peptonised milk, it will often be found that the vomiting to some extent continues, but, in judging of this, regard must be taken of the relation of the amount taken to that rejected, and also, it must be borne in mind that the stomach will not sometimes retain more than a teaspoonful at a time, therefore, with a good nurse better results may be obtained to start with by feeding by the teaspoon every half hour than by the bottle every two hours. Indeed, in these cases, a bottle is rarely tolerated or wise. In these cases the old saying a teaspoonful retained is worth a tablespoonful vomited, is very acceptable and true. Medicines are of use to allay the irritability and a good prescription is the following :—Dilute acid hydrocyanic four drops, bismuth carbonate 1 drachm, soda bicarb. 1 drachm. Mucilage and dill water 2 ounces, one teaspoonful every four hours.

Treatment.

If the vomiting continues despite the above, we firmly recommend that the stomach be washed out every day with sterile water. This often gives instant

Stomach Lavage.

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and marked relief and may be repeated two or three times daily.

Thirst is sometimes a marked symptom, in this condition, for the half-hourly sips of water or the injection of 2 or 3 ounces of saline solution slowly into the rectum twice a day is of value. Should the infant be very ill, or the disease protracted, the body should be rubbed twice a day thoroughly with cod liver oil. If there is collapse, a mustard bath followed by ten drops of sal volatile and brandy every four hours should be given.

Congenital pyloric stenosis.

It is well to keep in mind in a severe and persistent case of vomiting that the symptom may be due to a morbid condition of the stomach where there is thickening and spasm of the stomach outlet. Should this be suspected, medical aid should be sought at once.

DIVISION VI.—DISEASES OF THE LIVER.

CHAPTER XXXIX.

JAUNDICE.

MALARIAL LIVER AFFECTIONS.—CONSTITUTIONAL LIVER DISEASES.—ENLARGEMENT PECULIAR TO RACE.—DISORDERED LIVER AFFECTING THE URINE.

JAUNDICE.—Allusion has already been made to the spurious jaundice which sometimes accompanies or immediately follows birth (p. 31) ; we have also seen how chills may affect the liver (pp. 13, 14) and that a sluggish liver is sometimes the cause of a form of constipation which may be attended with a little jaundice.

Previous allusions.

In the jaundice which occurs at birth the white parts of the eyes are not tinged, nor is the urine discoloured, the bowel motions retain their natural colour, and there is no fever. The liver and bile are in no way concerned.

Spurious jaundice.

A true jaundice is sometimes seen *soon after birth*. The urine has a yellow tinge or distinct yellow colour, the eyes are similarly discoloured, and the bowel evacuations are clay-coloured or white. The infant is restless and distinctly ill. Often this condition is connected with some wasting affection such as diarrhœa and vomiting, or inflammation of the mouth, indicating mal-nutrition. Occurring *in older children* it is more likely to be due to chill, which has caused a catarrh (swelling and weeping) of the little duct which should

Ordinary simple jaundice.

Due to debility.

Catarrh of duct.

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lead away the bile, which then, not being able to escape through the duct, is forced back into the circulation.

Treatment.

The management of these cases is usually simple and satisfactory. *In the first class*, any diarrhœa or vomiting must be checked chiefly by regulation of the diet in the ways described under those headings, or a sore mouth must be cured (*see* "Mouth, affections of"). These measures, combined with ordinary care and nursing, and the administration of the red mixture or fluid magnesia in small doses for a few days, will usually effect a cure. In either class, warmth over the abdomen, with mustard-oil frictions over the liver, and rest in bed are essential. For the cases which occur *in older children*, commence by giving a powder consisting of one grain of calomel and three or four of rhubarb. This is not to be repeated, but the action of the bowels which has been thus secured is to be maintained either by rhubarb (49), podophyllin (57), aloes (58), or Epsom salts (54) twice a day, so that two or three motions will be the daily result. When the bowels are easily affected, it is best to employ the rhubarb. If the evacuations are hard and white, either the aloes or podophyllin may be alternated with the magnesia mixture or give $\frac{1}{6}$th gr. calomel and $\frac{1}{2}$ gr. hydrarg. cum creta, three times a day for 2 or 3 days.

Malformations.

A child is fortunately very rarely born with such a congenital defect as absence of the bile duct, but when it is so, it will, of course, give rise to jaundice in a few days. A fatal issue is inevitable, nor can it be long delayed.

Malarial liver affections.

MALARIAL LIVER AFFECTIONS.—Children who have suffered much from malaria, or who have been kept too long in a hot country, occasionally suffer from chronic liver diseases of slow growth, not easily recognised at an early stage. The child is probably liable to fever,

he wastes, becomes pinched and yellow, loses his appetite, and the bowels are irregular, generally constipated. At first the liver enlarges slowly without pain, and some small amount of abdominal dropsy may then occur. Jaundice is usually only very slight. The spleen is also found to be enlarged. This no doubt is only a phase of the general condition described at p. 243 *et seq.*, with this difference, that the force of the influences is expended mainly upon the liver. We therefore devote our attention chiefly to the organ attacked. But in any such case, it is all-important that a competent medical opinion should be first obtained and the blood microscopically examined. As this condition may be one of very great seriousness, the sooner such a child is sent out of India the better. The long sea voyage and residence in Europe are the proper remedies. If this cannot be done, removal to a healthy dry district in the plains, with perhaps a change to one of the lower and drier hill-stations during the months of exhausting weather, are to be earnestly recommended. An abrupt change from the plains to the higher hills is not desirable. Even a short sea voyage is calculated to help the initiation of improvement. Chloride of ammonium and arsenic are the medicinal remedies from which we may hope most in the first instance. But we must never forget that we can *control the functions of the liver* by regulating the food-supply. We, therefore, study to devise a diet which is at once simple and nutritious ; naturally we look to milk (peptonised or otherwise) as an ally to be relied upon, and we may use with it Mellin's or Savory and Moore's food for younger children, or if the proper age has arrived, a little broth may also be allowed twice a day. To older children we permit sweetbread and some easily digested fish as well

Treatment.

Control functions.

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as milk, and even a little lightly cooked tender meat once daily. But enough has already been explained in Chapter IX to guide as regards diet. Next we proceed to *drain the liver* by salines, of which for these cases the sal-ammoniac is especially suitable; we may give a child of two years old five grains dissolved in half a wineglassful of water twice a day (and double that quantity to a child of ten) on an empty stomach, while we also give arsenic (3) twice a day after food. But there is another important point, and it is this, that *to make the important chemical changes* which take place in the liver as *complete* as possible, a plentiful supply of oxygen is essential, hence the necessity for pure, fresh, cool air and very gentle exercise. If this cannot be obtained by the change of locality already mentioned, it is obvious that the freest ventilation and a quiet out-of-door life must be insisted upon as far as the climate and the condition of the patient permit. Constipation is never to be permitted. It is to be met in the manner described on p. 286. As the patient becomes better, probably after the lapse of some weeks of this treatment, especially when the low febrile condition abates or intermits markedly, the acid mixture (64) may be substituted for the sal-ammoniac, the arsenic being continued separately and a purgative given when required. As the child improves, quinine in solution with Epsom salts, dissolved with diluted sulphuric acid, should be given for a long time—a month at least—and then the case may be finished up by the use of the tonic aperient (70) till health is quite restored. In older children, 5 years and onwards and particularly if they have had dysentery previously, the fever, jaundice or hepatic pain may threaten liver abscess. In these cases, medical advice should be urgently sought, as proper treatment may abort the disease (emetine injections or ipecacuanha).

Drain liver.

Promote natural chemical changes.

Constitutional liver disease. Another form.

CONSTITUTIONAL LIVER DISEASE.—Sometimes the liver may enlarge and become otherwise diseased in consequence of a constitutional fault. There may then be some dropsy, and even a little jaundice. Usually the disease commences shortly after birth. The belly enlarges and becomes shiny. The liver may be easily felt. The child wastes, its skin falls into wrinkles, and probably an eruption will appear on the body. The best thing then to do is to prescribe the iodide of potassium (1) three times a day (without the bromide), and this should be continued for weeks, an occasional purgative of ½ grain of calomel with 3 grains of bicarbonate of soda being given when required. When a marked improvement has taken place, the iodide may have added to it the syrup of iodide of iron (71) in appropriate doses. But professional advice should be sought when opportunity offers.

Another constitutional cause may be connected with a family history consumption. The disease does not then generally show itself till the child has advanced in years (perhaps to six or seven). Fresh bracing air, iodide of potassium combined with the syrup of the iodide of iron and cod liver oil and a generous diet are the measures to adopt.

Enlargement confined to Indians and Eurasians. A liver condition peculiar to Indians.

Among the infants of the better class of Indians in Calcutta a disease of the liver of a very formidable nature prevails. It is also met with, but to a less extent, among the children of the Eurasian community, while it is unknown among the Europeans. It generally occurs in babyhood or the year succeeding it. The illness is often not suspected till the liver has attained an enormous size. Then probably some fever attracts attention, and an examination discovers the liver to extend perhaps halfway down the abdomen. The fever continues persistent, though seldom high till

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towards the end. Emaciation when it once sets in is steady, often rapid. The child becomes bloodless and weak. Eventually dropsy of the abdomen and some jaundice appear, and then in the majority of cases the end is not far off, but the process may occupy months.

Apparently this formidable disease is the result of overfeeding combined with confinement in the heated and close atmosphere of the female apartments, especially at night, together with want of open-air exercise in the daytime. Young infants are permitted day and night to hang at the breast, and the nourishment thus obtained is supplemented almost invariably from the commencement of life with cow's milk well sweetened. Later on rich sweetmeats, composed of flour, ghee, and sugar, are allowed regardless of intervals of time, while the suckling is prolonged up to two, three or more years.

Treatment.

A certain number of infants are rescued from this condition if it be detected early enough. The remedies are chiefly hygienic, and consist in scrupulous attention to a suitable dietary, which should be restricted in quantity and quality, starchy and saccharine articles being reduced to a minimum ; the intervals between meals should be prolonged beyond the customary periods, and no food of any kind whatever allowed during these intervals. If the child be a year old, it should be weaned absolutely. By these regulations the over-taxed and disabled liver obtains

Rest to liver.

intervals of rest, and as little work is thrown upon it as possible. We must further enable the organ to do

Cool fresh air.

that little without fatigue by supplying fresh air as freely as we can, by insisting upon thorough ventilation ; a life in the open air, gentle non-fatiguing recreation in a dry shaded garden if available, and carriage exercise twice a day are very useful. There

should be the freest facilities for moving about during the daytime in large well-ventilated rooms and verandahs, which should be kept cool. Nothing in the shape of wine should be allowed, notwithstanding the apparent weakness and loss of appetite. Quinine does not influence the febrile state, and seems to do more harm than good. A mixture containing rhubarb (2 grains), phosphate of soda (10 grains), and infusion of gentian, a teaspoonful for each dose, should be given twice a day and steadily persevered in, so as to cause two or three bowel evacuations daily. If this irritate the bowel, substitute the ordinary red mixture (49).

Medicines.

Should the fever produce loss of rest at night, it is right to give a single small dose of antipyrin (gr. ½—1) at bedtime. Change to the country from the town is calculated to prove beneficial, but it should be a carefully studied change.

Sometimes a child of four or five who does not seem particularly out of health will be observed to cry frequently and suddenly, without apparent provocation; just as suddenly he ceases and returns to his play. When this happens, the parent should watch the child. It will probably be discovered that he micturates very frequently, and further it will be found that the urine deposits a pink sediment. Plenty of outdoor exercise, restriction as to puddings and sweets, a sufficiency of properly cooked meat, a dose or two of podophyllin (57) to regulate the bowels, and effervescing citrate of magnesia three times a day, will effect a speedy cure. In addition 5 grains of bicarbonate of soda at bedtime for a few nights will help in the more troublesome cases, and fruits and sweets should not be allowed.

Disordered liver affecting the urine.

Treatment.

DIVISION VII.—DISEASES OF THE NERVOUS SYSTEM.

CHAPTER XL.

HEAD SYMPTOMS.

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Head symptoms of fever.

THE expression "head symptoms" is one which is frequently used, and on the whole its signification is pretty well understood.

When a child is suffering from any acute febrile complaint, certain signs of nervous disturbance may arise from the excessive heating of the brain and spinal cord, and it has been shown that the undoubted dangers thus arising are capable of being controlled (*see* Fever).

We, however, speak now not of head symptoms due to a previously existing febrile disease, but of symptoms arising independently of such a condition.

Early symptoms of brain mischief.

A child who has, perhaps, up to the present moment, been in his usual health, or who may only have been falling off a little for a short time previously, without being considered actually ill, suffers from disturbed sleep; he grinds his teeth at night, he vomits and becomes restless and irritable; the bowels are deranged, nearly always constipated; the look is haggard, the appetite is gone, the head is hot, the child is annoyed by noise and light, he starts up from his sleep in a state of terror, is generally feverish, and complains of pain in the head. Such are the earlier signs of commencing brain mischief.

Progress of the case.

These signs may, however, have attracted but little attention, notwithstanding that they have perhaps occupied several days. It may be that the child's condition has not been noticed till there is a knit brow, persistent vomiting, stupor, twitchings, or perhaps rigidity, of the muscles, some fever, squinting, irregularity of the pupils, alternate flushings and pallor, and occasional shrieking and excitement from which the patient soon again lapses into drowsiness, to be followed perhaps by delirium and convulsions. The fontanelle, or opening in the bones of the head of younger children, will be felt prominent, bulging, and perhaps throbbing.

Similar symptoms due to an opposite cause, *viz.*, bloodlessness without any disease of the brain.

These are the head symptoms which usher in inflammatory affections of the brain. But symptoms resembling them in many respects may arise under totally different circumstances, and from a wholly different cause, importing a different disease, and requiring a diametrically opposite kind of treatment. A case of the kind may be described as follows:—A child has been under treatment for a serious diarrhœa, he becomes heavy and drowsy, but he does not sleep, he lies back upon the nurse's lap unwilling to raise his head, the eyes remain half open; perhaps there is vomiting, and the face is wan and pinched; every now and again he starts with a piercing shriek, which subsides as a series of shrill diminishing moanings or whinings, till the patient resumes for a short time his previous lethargic state. Noises startle the child. The body is cool, frequently cold. If the fontanelle has not closed, it will be found to be depressed. A convulsion is apt enough to succeed this state if relief be not afforded, and should it unfortunately occur, no very hopeful view of the issue is justifiable. Here, again, the child is suffering from "head symptoms"; but

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let us note the difference between these and those previously alluded to.

Distinction between the two.

A.	B.
Real Brain Affection.	Simulated Brain Affection.
1. There has been no previous acute illness.	1. Always occurs in the course of some exhausting sickness, or after premature weaning, either of which has greatly reduced the child.
2. Always distinct fever as measured by the thermometer.	2. Never fever, usually a lower temperature than that of health.
3. Constipation.	3. Diarrhœa
4. Frequent flushings of the face.	4. Always pallid.
5. Intolerance of light.	5. No intolerance of light.
6. Squinting and well-marked general head symptoms from the beginning.	6. Absence of head symptoms till exhaustion has become great.
7. Vomiting almost always present.	7. Vomiting only occasionally present.

Vital difference.

The difference between the two cases is really this; in the latter the brain has been so drained of its proper blood-supply that the suspension of its functions is threatened; in the former the brain is so congested that its functions are similarly in immediate danger.

The causes of the one (A) may be (1) constitutional predisposition such as tuberculosis which has been called into activity by bad hygiene or exposure to the sun; (2) blows on the head may suffice; (3) disease of the bones of the ear extending to the brain (*see* Ear). Of the latter (B) there is but one cause, *viz.*, great exhaustion of the vital powers. Premature weaning may cause it. As might be anticipated, it is more frequently met with in India than in Europe, because of the greater frequency of exhausting diarrhœas and the debility of climate.

It cannot require any further remarks to make clear the necessity for a different treatment in either case.

Treatment. Of real brain symptoms.

(A) Symptoms indicating congestion or the earlier stages of inflammation require to be met with a light diet, active purgation, absolute quiet of body and mind, cold to the head, and sedative medicines; whereas (B) symptoms of brain bloodlessness are to be treated with concentrated nourishment, stimulants, astringents, and the bromide of potassium as directed on p. 294. Of this latter no more here need be said than to quote a caution as given by Mr. West. "If," he says, "in a case of this kind you fall into the error of regarding the head symptoms as signs of active disease, and withhold the medicines that might have checked the diarrhœa and soothed the irritability, while you apply cold lotions to the head and give the child nothing more nutritious than barley-water in small quantities, because the irritability of the stomach, which results from weakness, seems to you to be the indication of disease in the brain, the restlessness will before long alternate with insensibility, and the child will die either insensible or in convulsions."

Of spurious brain symptoms.

Detailed treatment of the first.

To enter more into details regarding (A) the commencement of active mischief within the head, the treatment should be as follows:—If the stomach is at all loaded, we should begin with an emetic of ipecacuanha (39, 40); indeed, this is a safe proceeding in any case. Then, with as little delay as possible, a strong purgative (56) should be given, and at the same time an enema (45) administered. Of mixture No. 55, two teaspoonfuls should be given twice a day to keep up the purgation.

In the meantime the child should have been put to bed in a darkened and cool room, and the diet should consist only of light slops. That the most perfect

tranquility should surround the child is a matter of the highest importance; no one should play with him, or even speak with him, and irritability on his part should be controlled by means of the tepid bath, and the administration in the first instance of a dose of chloral (8), and subsequently the steady use of the bromide of potassium mixture (9). Cold should be applied to the head by means of ice (p. 172) or cold lotions (13, 35), and the room should be well ventilated.

By strict attention to these directions a serious attack may be averted.

Water on the brain is a dropsical condition produced by the further progress of brain disease, which is at first indicated by the symptoms (A) above described, but they are then of a chronic nature, and come on very insidiously. Indeed, the enlargement of an infant's head, together with its loss of flesh, are frequently the first signs which attract attention. Then succeed squinting and the other signs enumerated, till convulsions terminate life or the case becomes chronic. All that can be done in such an event is to adhere to the general laws of hygiene, to nourish the sufferer thoroughly, keep the bowels well open, and to obtain medical advice as soon as possible.

CHAPTER XLI.

CONVULSIONS.

MANY allusions have been made to convulsions on previous pages.

"Warnings."

The phenomena of an attack are well known. Sometimes, but not always, there are "warnings" of the approach of a fit, such as convulsive twitchings of the face, startings during sleep, inward bending of the thumbs upon the palms of the hands, the fingers being doubled over them; a somewhat similar condition of the toes, and squinting.

Symptoms.

When a fit occurs the child becomes deadly pale, the features are distorted, the eyes stare and are rolled about, the breathing is irregular and catching, the body becomes rigid, and the hands are clenched. All this may happen in a minute or less, or it may occupy five minutes, a quarter of an hour, or even more. The more violent the convulsion, the shorter the attack usually is, and *vice versâ*. When the fit is over, the child comparatively resumes the appearance of health, a perspiration succeeds, and he falls into a sound sleep.

Dangerous symptoms.

A child seldom dies in a fit, but of such a catastrophe there is danger when spasmodic closure of the air-passages takes place. In that event the face becomes purple, the head is bent backwards, violent efforts are made to breathe, a crowing noise like that of croup is made as the air tries to pass through the narrow chink, but it becomes fainter and fainter till it eventually ceases altogether, or a louder and prolonged sound proclaims relief.

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Practical classification.

The causes of convulsions may for practical simplicity be divided as follows :—

1. Convulsions the result of *overheating of the blood*, and through it of the brain and spine. Such are the convulsions which frequently occur during a state of high fever, without any special warnings, except the elevated temperature of the body. Such an attack may usher in, one of the specific fevers such as measles, pneumonia, diphtheria ; or even infantile paralysis.

2. The convulsions of *bloodlessness of the brain.* It will be recollected that this form of convulsions occurs only in children who have been subjected to exhausting illness, and that it comes on with marked head symptoms (p. 334—335). They may also occur in the course of severe diarrhœa or anæmia.

3. Then there are the convulsions of actual *brain affection*, which commence with well-defined head symptoms which usually have existed and attracted attention for some days before the seizure occurs (p. 335). In such cases the convulsions are generally one-sided. And the cause is some local condition irritating a portion of the brain, or a tubercular infection of the coverings of the brain.

4. Finally, there are what may be termed *simple* convulsions ; that is, the fit occurs without the previous existence of any illness. Teething, for instance (which is popularly held responsible for almost all results of neglect), may, no doubt, increase the liability to convulsive disturbance. Fright has been known to cause convulsions. Mental suffering or shock on the part of the nursing mother may be a cause. Rarely, worms occasionally give rise to convulsions. The children of epileptic parents are certainly more liable to convulsions than other children. *Impropriety in the matter*

of diet is a very frequent cause. And is one that is readily understood when one considers the delicate structure and nervous impressionability of a child. The mother or a friend may give some food which is grossly unsuitable to the age and digestion of the child, the result being that irritative impulses are carried to the highly sensitive brain, and a convulsion or "nerve storm" is precipitated. Indeed, *errors in diet are by far the most common and frequent causes of infantile convulsions* and should be always borne in mind when treatment is considered. Such attacks are sometimes called reflex convulsions as they result from irritation of the brain from distant nerve impulses. It is said that the children of those who marry very early or very late in life are unduly liable to be affected. Rickets is another cause.

Necessity for classification.

When a case of convulsions presents itself, there can be no hesitation in at once classing it under one of the foregoing heads, and this is very essential, because the treatment is different in each instance.

Facility of distinction.

Has the child strong fever? No. Then the case is at once excluded from No. 1. Is he undergoing any exhausting disease; is he being severely purged? If not, and the child has been comparatively well till seized, No. 2 is excluded. Has he suffered from previous head symptoms (p. 334), without any debilitating complication having existed? If not, the brain itself is not the origin of the present seizure. But if in the absence of these three a child is seized with convulsions, the case must necessarily fall into the fourth class, and it becomes evident that some removable cause has temporarily deranged the working of the nervous machinery.

Treatment.

No. 1. The treatment of a case of convulsions due to heat of body consists in reducing the temperature

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(1) Convulsions of fever.

by immediately placing the child in cold water up to its neck, and pouring cold water over its head as described at p. 169. No time should be lost in undressing the child and in making preparations, but clothes and all, just as he is, he should be immersed in the bath. Consciousness will soon return and sleep be secured. The subsequent treatment is to consist of the adoption of the means detailed on p. 170 *et seq.*, conjoined with the special treatment recommended for the particular form of fever from which the child is suffering.

(2) Convulsions of exhaustion.

No: 2. Convulsions due to exhaustion are rather to be prevented by the means described at pp. 293-294. When a seizure arises from this cause, it is always of very serious import. The child should be put into a hot bath to which mustard has been liberally added; he should be handled with the greatest gentleness, subjected to no sudden jerks; he should not be placed in the sitting posture, and care should be taken to keep the head low. While in, or after removal from the bath, we should endeavour to get him to swallow a little brandy and water, to which from five to ten drops of sal volatile have been added. Plasters made of one part of mustard and two of flour should then be applied to the calves of the legs. Rolled in a blanket, the child should be placed close to a good fire if the weather be at all cold. If the weather be damp, even though so hot that it is necessary to keep the windows open, a fire should be kept up in the room. Should consciousness return, we must pursue actively the administration of nourishment and stimulants; the latter, however, only with much liberality while great depression lasts. So much having been gained, we resume the preventive treatment detailed on p. 294.

(3) Convulsions of brain disease.

No. 3. Here, again, we hope for most from preventive measures. But when a fit occurs, the child is to be put

into a warm bath (about 98° temperature), and cold applied to the head, either in the form of ice or of a cold lotion (13, 35). A couple of grains of calomel may be placed upon the back of the tongue. As soon as the power of swallowing is regained, a dose of chloral (8) is to be followed by the bromide of potassium mixture (9) each hour till all disposition to a return of the fit has passed away, and then the treatment described at p. 337 should be resumed.

(4) Simple convulsions.

No. 4. For a simple convulsion the child is to be put into a warm bath (temperature about 102°), and while there cold water is to be sponged over the head. As soon as possible administer an enema (45). When capable of swallowing, an emetic (39, 40) should be given to empty the stomach and cause the skin to act. A strong purgative (56) should follow at the first convenient opportunity. The gums should be examined, and if anywhere angry and swollen by a pressing tooth, the gum-lancet should be brought into requisition. A dose of chloral (8), followed by the bromide of potassium (9) at intervals of an hour till all undue excitement has subsided, should be given, but if the patient cannot swallow, and the convulsions continue, the chloral should be administered as an enema. If the bowels have not acted within three or four hours, a draught of Epsom salts and senna (53) should be given; it is a matter of moment to relieve them thoroughly.

General measures.

Great pains should be taken to encourage the sleep which usually succeeds convulsions. By means of the bromide of potassium rest may always be assured in cases where restlessness succeeds the fit, and a grain of chloral for each year of age of the child may be added to the *first* dose; or, the bromide of ammonium and chloral may be combined as in formula 8 (*b*). Till sleep is procured there is always immediate danger of a

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recurrence of the seizure. The most perfect quiet should be observed. No attempts should be made to play with the child or to amuse him after he has recovered his senses. Subsequently for a few days he should be put upon a spare diet, and the bowels should be kept rather loose, except in class No. 2, when constipation, if it be induced, is to be encouraged. A cool surrounding atmosphere is essential. Great care should be taken to see that the mouth is free from all obstruction during insensibility, and the tongue should be drawn forward if it has fallen to the back of the mouth. If the cause of the seizure has not before been apparent, every effort should now be made to discover it, for however well the patient may seem after the fit, there certainly was some cause which has probably not been permanently removed by the management which has been adopted during the fit. It may have been improper food, indigestion, worms, flatulence, fright, or so forth, against any of which, when the accusation has once been established, precautions should be taken during the whole remainder of childhood.

CHAPTER XLII.

INFANTILE LOCK-JAW AND INFANTILE PARALYSIS.

Frequency and fatality.

THIS affection, though rare among European infants, had better be noticed here, on account of the alarm and sense of helplessness which its occurrence is sure to occasion. Among the children of Indians the disease is unfortunately very common, and it is the chief cause of the terrible infant mortality of Calcutta. It is much more frequent in hot than in cold or temperate climates.

Occurs only during the first days of life.

The affection usually occurs between the third and tenth days after birth ; though it may happen within twelve hours of life, and still more rarely it may make its appearance after the ninth or tenth day.

Symptoms.

Though the disease runs a rapid course, yet there are always premonitory symptoms, such as restlessness, whimpering, broken sleep, yawning, and hasty snatches at the mother's breast, which, however, the infant soon relinquishes. Most probably the first thing which attracts the mother's attention will be inability on the part of the infant to take the breast, a fact which the mother will at first be inclined to attribute to some fault of her nipple, unless she happens to examine the infant's jaws, which will be found more or less stiff. After a few hours the jaws become fixed and the features undergo alteration, the lips are drawn tightly over the gums, the corners of the mouth are pulled downwards, and the half-closed eyes assume a peeping expression. The limbs and spine soon become partially

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or wholly stiff, the hands are clenched, and the head is bent backwards. At intervals a quick spasm passes through the whole body, a symptom the frequent repetition of which indicates a rapidly fatal ending. From the commencement the temperature of the body is high—103° or 104°.

Seriousness.

Terrible and fatal as is this affection, the infant's condition is not altogether hopeless, though it must be admitted that recovery is the exception.

Causes.

As to cause, it has been conclusively proved that it is due to germ known as the tetanus bacillus which lives in the dust and dirt. If then the child and the raw surface of the navel-string are not carefully and cleanly protected, the bacillus being carried in the dust on the air may infect the delicate infant. It will then be appreciated how important it is that the dressing on the cut cord be antiseptic or sterile beyond doubt.

Treatment.

That the disease is preventable by avoidance of the cause is the most important point to bear in mind concerning it, for, unfortunately, treatment has not led to satisfactory results. The great difficulty in the management of such a case is, of course, as regards the introduction of nourishment. The jaws must be separated by means of the end of a spoon, or a small piece of wood protected by linen rolled around it, and drop by drop some of the mother's milk, or a little milk and limewater, is to be admitted cautiously from a spoon. (A surgeon would feed the infant by passing a soft tube through the nostril down the gullet.) An enema of a teaspoonful of the same every hour may also be tried, a small glass syringe being used with the utmost gentleness. The warm bath may be tried ; and a grain of chloral and two grains of bromide of potassium, dissolved in half a teaspoonful of water, should be given every two hours or oftener till the

child sleeps or spasm is relaxed ; enough being afterwards given at intervals to keep up this effect. Some lives are in this way saved. If the medicine cannot be swallowed, it should be administered as an enema. The best plan is to introduce it by means of the hypodermic syringe, but the presence of a medical man then becomes necessary, who will in many cases have to administer a little chloroform in order to relax the spasms before feeding.

Infantile Paralysis.

Is happily rare.

This also is one of those diseases which, though happily rare, comes upon the child with such suddenness that it is essential the parent who is out of reach of medical aid should know something of it, in order to obviate that despair which total ignorance in the presence of a catastrophe is sure to engender.

Paralysis in child not so serious as in the adult.

Paralysis—that is, loss of the power of motion over one or more of the limbs—is always an anxious affair ; but it will be some satisfaction to the parent to know that in the child its import is not nearly so serious as in the adult.

Symptoms.

The symptoms are few ; often there is nothing more than loss of motion to be observed, that is, the paralysis is essentially one of motion and not of sensation. Sometimes, however, with this there is an increased degree of feeling in the helpless parts ; sometimes, but very seldom, there is diminished sensibility. Most frequently the legs are affected, but it may be the arms, or an arm, or an arm and a leg. All the muscles of a limb are rarely paralysed, hence the patient is able to move perhaps his fingers or toes, or even partially to bend an affected limb. Usually ushered in with a brief violent fever, the paralysis is discovered when an attempt is made to lift the child. Recovered

Prospects.

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from the fever, the amount of paralysis remains stationary for a variable period—a week to a month—when the palsy passes gradually away from certain muscles, but remains as before in others, and these latter become flabby and waste away till the patient has passed into a chronic condition, and certain contractions and deformities occur in the course of time. The amount of improvement which may take place in the second stage is very variable; sometimes it is but slight, sometimes great. Certainly the danger of extension is passed in the first twenty-four hours of the disease, and "in the chronic stage, unless there is some sign of returning power within three weeks, very little recovery will occur" (Gowers). Immediate danger to life is not involved. Subsequently the condition of the child is fairly satisfactory, even should he not recover in the first instance; there is no suffering, growth and education advance, the mental development is not impaired, and the sleep and appetite remain natural.

Treatment.

The initial fever will have to be treated in the ordinary way (*see* Fever). Medical advice should afterwards be procured, but in its absence the parent should seek out all possible causes of nervous irritation, and endeavour to remove them; the teeth should be examined and lanced if necessary, the possibility of the presence of worms considered, the bowels regulated, every minor matter thought of, and every clear conclusion acted upon. An iodide of potassium mixture (12 grains to one ounce of water; dose, a teaspoonful three times a day) should be given for about a week following the attack, and then iron, either as steel and quinine (68) or the syrup of the iodide (71), should be substituted and persisted in for a long time. The affected limbs should be carefully

shampooed daily, after the first week, with a stimulating liniment (18) or mustard oil. The diet should be liberal, and the child should be taken as much as possible out-of-doors. Galvanism is a remedy which, at the proper time, the physician is pretty sure to employ. Finally, we add the teaching of Mr. Robert Hutchison, "the nutrition of affected limbs can be helped by warm covering and by douching with salt and water, followed by vigorous friction with a rough towel ; any degree of voluntary movement is far more valuable than any amount of massage, and the child should therefore be encouraged to use the limb as much as possible. This can be done by putting a little collar of bells round the wrist or ankle and getting him to ring them by moving the arm or leg, the finer movements can be developed by teaching him to pick out patterns with a pin or by any similar device which the intelligence of the mother can devise. For the club foot and other deformities which so commonly result from infantile paralysis one must have recourse to surgical aid."

If of malarial origin.

In case the patient has been previously much the subject of malarial fevers, quinine in small doses should be given in addition to the other remedies, and a change of air sought without delay. A sea voyage is always calculated to benefit these cases.

The following directions to mothers are in use at the Great Ormond Street children's hospital :—

LOWER LIMBS—CLOTHING.—They must be kept warm day and night. Knitted woollen stockings to come up above the knees If these do not keep the limbs warm, woollen overalls to be worn outside the stockings. The overalls to come up the thighs. If these are not sufficient to keep the limbs warm, the overalls must be lined with cotton wadding, which is to be quilted so as to hold fast to the overalls. For the night a flannel sack, made in the shape of the leg and coming up to the

top of the thigh, is the best. This sack should be lined with cotton wadding.

RUBBING.—For a quarter of an hour twice daily. Set the child on a chair, or lay it on the bed, or let it sit on somebody's knee. 1. Rub the paralysed leg from the foot to the top of the thigh. Rub upwards only. Put the broad part of your hand on the back of the child's leg. In rubbing the thigh, you may put your hands, first on the back of the child's thigh, and afterwards on the front of its thigh. But always rub upwards, and be sure to go as high as the child's loins. Whilst rubbing with your right hand, hold the child's foot with your left. Use for rubbing any kind of oil.

2. Take hold of the child's leg just above the ankle, with your two hands. Rub round the leg with your two hands in the opposite direction, as though you were wringing out sheets. Work up the leg and thigh, from the foot up to the top of the thigh, in the manner described.

3. Take the child's calf with your two hands. Put your fingers to the back of the leg and your thumbs to the front, squeeze the soft parts out between your fingers and thumbs, so as to flatten the leg and make it as wide as possible. Work right up the leg and thigh in this manner.

4. Put your right hand over the front of the child's knee. Put your left hand against the child's foot. Push up the child's foot, and holding your right hand in front of the child's knee you will prevent yourself doing any harm. You want, if possible, by pushing the child's foot, to make the child push against your left hand with all its might. *This is the most important of all the exercises.*

5. Flip every part of the leg and thigh with your fingers, so as to make the whole of the limb quite red and warm.

6. Gently rub up and down all over. This will take the stinging away which was left by the last movement.

BATHS.—Once a day let a large jugful of hot water, containing two handfuls of salt, be poured down the leg and thigh. Then pour half the quantity of cold water over the leg and thigh. Then rub thoroughly dry with a towel, and continue to rub until the limb is perfectly warm. *Mutatis mutandis*, the directions apply equally of course to the upper limb when that is paralysed.

Other kinds of paralysis.

There are *other kinds of paralysis* from which children occasionally, though fortunately rarely, suffer, but it is unnecessary to enter into their consideration here. Already allusion has been made to one of these (p. 31). They are chiefly characterised by the paralysis being confined to one side of the body or by a rigid condition of some of the limbs. Such states may happen after convulsions, and are occasionally noticed at birth. The brain has received some injury, but many of these cases recover. The parent can do but little beyond treating convulsions, paying every attention to the nutrition of the child, handling it with care, disturbing it as little as possible, administering the iodide of potassium mixture mentioned on p. 348, and seeking medical aid as soon as it can be obtained.

CHOREA.

Description.

Children between eight and ten years of age who have suffered from rheumatic fever are those who are most liable to the affection called Chorea, or St. Vitus's Dance—girls more than boys. It is characterised by an exaggerated fidgetiness and irregular uncontrolled movements, together with weakness of the muscular powers. Sometimes the speech is affected. There are all degrees to which the violence of the movements may attain, but they cease during sleep. The temperature is generally below normal. The disease has a tendency to recur and is particularly associated with rheumatic fever or the manifestations of the rheumatic diathesis.

Prospects.

Most cases recover completely, the more acute the onset, the more rapid the recovery. The average duration is ten or eleven weeks.

Treatment.

Complete rest of body and mind are of the first moment in treatment. The *child should be confined to*

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bed till the more violent movements cease and should be kept in bed for a week after all movements cease. And when the child is allowed up, long hours of sleep and rest in the middle of the day must be enforced. These children rapidly become very anæmic, and it is very necessary that careful lookout should be kept on the heart's action, for heart failure rapidly may ensue from the excited action of the muscle in this disease. Should the movements become very severe, medical advise must be sought. The child should be carefully protected from hurting itself by bandaging wool over the bony prominences, such as the elbows, heels, and back of the head. These objects may be greatly assisted by bromide of potassium (9) and sodium salicylate, sulphonal or chloral (*see* Index). A regulated use of the muscles by occupying the time in writing, drawing, or knitting is useful, when the movements permit the attempt. A genial climate, enabling the child to live in the open air, is a great aid. Arsenic (three to five drops of Fowler's solution of arsenic for each dose, three times a day in a wineglassful of water, after food) is the remedy upon which to rely medicinally. It should be given intermittingly in gradually increasing doses for a prolonged period, probably for six months, alternating it every three or four weeks, for a similar period, with "Blaud's pill," till recovery is completely established. Cod liver oil may afterwards be used. A liberal dietary should be observed throughout. Massage should be used to improve the muscles.

Chorea is decidedly uncommon in India.

HEAD-NODDING

Is a curious affection, but happily of no great gravity. It is most common between six and twelve months of age, but may occur somewhat earlier or

later, very seldom after the eighteenth month. It is often associated with oscillation of one eyeball. The movement may be pure nodding, or the motion may be up and down or from side to side.

These are symptoms which would naturally cause alarm, but they generally disappear spontaneously in a few weeks or months, seldom persisting beyond eighteen months of age. The intellect is not impaired.

Attention to the general health, bracing air, and the employment of bromides for a short time, is all that is necessary.

DIVISION VIII.—AFFECTIONS OF THE KIDNEYS AND BLADDER.

CHAPTER XLIII.

DROPSY.

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Definition.

DROPSY signifies the accumulation of a watery fluid, either in the abdominal cavity, or in the loose fat which lies immediately underneath the skin, throughout the whole body. It may involve the abdomen and the body generally at the same time, or it may be only partial, the legs, below the knees, being the only parts affected.

Not so serious as in England.

Dropsy among children in India is not so serious a complaint as it is in England, because the majority of the Indian cases are of malarial origin, and are simply a sign of general debility, whereas in England, scarlatina, by damaging the kidneys, is the most constant cause.

Symptoms.

The countenance is the first part to appear puffy and swollen if the child has recently been much in the recumbent position ; if otherwise, the feet are the first to swell. The swelling of a dropsical limb may be known by pressing the point of one of the fingers steadily into it for a few moments, the pit so caused will remain after the pressure is removed. The belly at the same time will probably begin to enlarge, and the child assumes a pasty appearance.

Classification. (1) Malarial.

For popular practical purposes dropsy had better be divided into two classes, *viz.*, (1) those which are due to malarial debility or simple anæmia, and (2) those

which arise from kidney affections.* The first may be known by the fact of the child having been a sufferer from malarial fever, which has left him weak and debilitated, the spleen may be enlarged, and the other signs mentioned on page 243 will be present, without any appearance of kidney disease. The second is recognised by the occurrence of a distinct febrile attack accompanied with pain across the loins, and a very scanty flow of urine, having ushered the attack in, or the fact of its having followed upon an attack of scarlatina. But in no case should it be neglected or treated until a competent opinion has been obtained on the urine analysis and the general condition of the patient.

(2) Kidney disease.

As to the prospects of these cases, dropsy is always to be regarded as a serious complication, but the majority of the malarial cases recover under proper management.

The first is very amenable to treatment.

The second class of cases is much more serious. So long as the quantity of urine voided remains scanty, and while at the same time the dropsy goes on progressing, anxiety will justly be great; but we have seen many formidable cases of dropsy in India, in which the kidneys were severely affected, recover; so we cannot but think the proportion of recoveries is greater than in England, on account of the Indian climate, which increases so greatly the facilities for preserving or re-establishing the action of the skin.

The second serious.

As to treatment:—(1) The dropsy of malarial debility, being only a result of a general condition, is

Treatment.

* Dropsy is also a symptom of advanced liver disease, and it occurs too at the end of bad heart cases, but these affections will probably have been long under treatment before the dropsy appears, and the parent will not be called upon to diagnose and treat such cases.

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to be managed in the way laid down at page 218, which in the majority of cases will yield a cure. (2) The dropsy which springs from the inability of injured kidneys to draw away sufficient water from the body, is to be treated upon different principles. The great point here is to re-establish the functions of the skin, and to cause it to act as much as possible; in fact, we endeavour to get the skin to do a great part of the work of the kidneys, which thus obtain rest, while at the same time the noxious materials ordinarily got rid of through the kidneys are withdrawn through the skin, and blood-poisoning is prevented. From the commencement, therefore, we keep the child in bed and as warm as possible, administering a mixture containing spirits of ether, ½ a drachm, and tincture of digitalis, 2 minims per dose, with water, every third hour. A vapour bath (*see* Index) should be given daily in acute cases; or even twice a day if the child be strong enough to bear it and the weather permit. A copious perspiration should be induced on each occasion. Still with the same objects (*viz.*, relief to the kidneys and removal of noxious material), the *bowels should be kept loose* by the use of seidlitz powders (61) occasionally, or by mixture No. 55. This is a matter of prime importance. The diet should be light but nourishing, consisting chiefly of milk and farinaceous foods, such as bread and butter and puddings. Vegetable clear soups may also be allowed in moderation, but no meat till there has been considerable improvement. On no account should alcoholic stimulants of any kind or any medicine containing opium be given. A large bran poultice should be prepared and placed upon the bed, the child should then be laid upon his back so that the poultice envelop the whole of the loins; this may be done for an hour, morning and evening; or longer on each occasion, if

Re-establish functions of skin.

Vapour bath.

Purgation.

Diet.

Poulticing kidneys.

the child have patience to bear it. By these means the acute symptoms will be overcome, the feverishness will diminish, and the quantity of urine increase. As soon as this is effected, a diuretic mixture (38) will be of service, but not before. A very excellent preparation is that known as Imperial Drink which is made by mixing the juice of two limes with a teaspoonful of potassium acid tartrate and then adding a tablespoonful of brown or white sugar, and stirring with two pints of boiling water. On cooling, the patient should consume this in divided quantities during the twenty-four hours. When convalescence is fairly established, a course of tonics (68) may be commenced. It may be judicious to combine the tonic with an aperient (70) for a time, to ensure and prolong the relief to the kidneys. The child should not be exposed to any risk of cold or chill and the loins should be protected. As soon as available, a medical opinion should be obtained, and an analysis of the urine done from time to time.

Subsequently tonics and aperients.

Incontinence of Urine.

Children sometimes suffer from inability to retain their urine except for very short periods. In most cases it is only at night that the annoyance occurs, but occasionally it happens both by day and night.

Generally happens at night.

Very often the cause is simply bad management, by which a dirty habit has been engendered, and which may become more or less constant and difficult of removal. Acidity of the urine, the presence of worms in the intestine, an elongated and adherent foreskin in boys, or only a general constitutional weakness, are each of them sufficient to produce this effect.

Causes.

To remedy this state of things is frequently not easy; but whatever efforts are made, without the assistance of a careful nurse no good need be hoped for. No fluid

Trustworthy nursing essential.

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Its details.

should be allowed a few hours before bedtime. The child should be taken up two or three times to urinate during the night. Upon each occasion he should be thoroughly roused, so that the act be wholly voluntary on his part. He should lie upon a hard bed, and be prevented from resting upon his back by fixing a cotton reel or cork behind, by means of a string passed through the hole, and tied around the waist; this will cause him to awake or move again on his side, should he happen to lie upon his back.

Correct the urinary acidity.

If any of the conditions enumerated as causes can be accused of originating the trouble, they should be treated, but if this cannot be done, the acidity of the urine should be tested with litmus paper. If it be great, three to five grains each of bicarbonate and citrate of potash may be given in a little water three times a day.

Caution.

The urine, it is to be recollected, is naturally acid, therefore the litmus paper ought to turn slightly red, but it should not become instantly of a bright red colour. On no account should the medicine be continued long. It would be wrong to neutralise the acidity altogether, but the litmus paper will inform us.

Diet important.

But it is chiefly by a very careful regulation of the diet that a healthy state of the urine is to be maintained. Entire withdrawal of meat from the diet has been known to cure cases. Cold sponging to the spine just before bedtime is sometimes useful if it be not too annoying to a sleepy child. These preliminaries being settled, the child should be put upon steel and quinine (68), unless he be of a particularly weakly constitution, when the iodide of iron and cod liver oil (71) will suit better. Constant outdoor exercise, amounting to slight fatigue, should be strictly enforced, and every means to improve the general health adopted.

Medicine.

If there be a congenital defect, a surgeon should be sought, to perform the simple operation of circumcision, which is frequently a very effectual remedy.

There are other medicines (belladonna, strychnine, and ergot) which are of great value in these cases, but they are of a nature that precludes their use by any but a medical man. Belladonna, in the form of tincture, may, however, be employed by adding three or four minims to each dose of prescription No. 9, giving the mixture three times a day, and regulating the dose of bromide according to the age of the patient. For a nervous, irritable child it is better to commence the treatment in this way before resorting to the tonics named.

Excessive quantity of urine.

In those rare cases in which *urine is habitually voided in excessive quantities* in childhood, valerian is a remedy which is likely to prove very serviceable—10 to 15 drops of the tincture in water three times a day for a child four years old. For older children the valerianate of zinc, $\frac{1}{4}$ grain in water three times a day, will be better. But a doctor should be consulted with a view to having the urine analysed, lest Diabetes be the cause.

The effect which liver derangement has upon the urinary function has been already spoken of (p. 333) and should be remembered.

DIVISION IX.—SKIN DISEASES.

CHAPTER XLIV.

NETTLE-RASH, ECZEMA, PRICKLY-HEAT, HERPES, ITCH, RINGWORM, BOILS, ETC.

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1. RED-GUM or WHITE GUM (Strophulus) are names given by nurses to a trivial eruption of the skin of infants, consisting of little groups of red or white pimples, hard and shotty to the feel, often with a translucent centre, but from which no fluid exudes when pricked. The forearm, leg, and trunk are its favourite sites. It is very irritable. A modification of diet, a few doses of the red mixture, scrupulous cleanliness, and the application of a lotion consisting of one drachm of oxide of zinc, half an ounce of glycerine, and six ounces of lime water, will relieve the irritation and soon cure the complaint.

2. Nettle-rash.

2. NETTLE-RASH may be caused by the presence of worms in the intestine, but nearly always improper food, or a chill is the cause; for instance, unripe fruit, cucumber, pickles, and so forth. The rash consists of a number of elevated, itching, and burning wheals, very like in appearance the effects produced by the sting of a nettle; it seldom lasts more than a few days, and requires for its management the simplest treatment,—an emetic, if there is likely to be any offending food in the stomach; purgation (49, 52, 55), careful regulation of the diet, and the administration of three or four grains of bicarbonate of

Description and treatment.

soda in some infusion of chiretta after each meal, for a few days. Locally, tepid sponging or a warm bath affords almost instantaneous relief; oil should be applied to the part afterwards, or, better still, the zinc and lime water lotion above mentioned. Bicarbonate of soda dissolved in equal parts of glycerine and rose water is an elegant and efficient application.

3. Eczema. Very troublesome.

3. Eczema is often a troublesome affection. It usually selects the bends of the elbows and knees, the scalp, and, in young children, the cheeks, neck, and arms, for its position. When on the scalp it is sometimes very chronic. A number of minute watery vesicles appear, the surrounding skin being irritable, red, and hot. The contents of the vesicles soon become whitish, the irritation increases, and the child is sure to scratch and break them. The discharge still further irritates the surrounding skin—indeed, it seems almost to burn it and to remove the thin outer layer. After a short time the discharge hardens into a yellowish crust, which cracks in many places, and from these cracks more of the clear irritating fluid exudes, as well as from under the outer edges. Portions of the crust may even become detached, leaving behind a raw, angry, moist surface. When of a mild form, the crops of vesicles die away naturally, the skin of the affected part scaling off afterwards; but fresh crops of vesicles are apt to recur.

The eruption.

Mild form.

Causes.

Eczema is caused by defective digestion, and it indicates debility. It is not contagious.

Treatment. Local.

The objects of treatment are to relieve the local distress and to improve the general health. A piece of stiff cardboard bandaged round each elbow acts as a splint and prevents the child scratching the upper part of its body. Soap should be avoided. A poultice should be applied to the scabs and repeated until the

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latter are detached. An excellent application to remove scabs is to soak some dosooti or lint in olive oil and then bandage this on over-night. In the morning the scabs will all easily come off; the inflamed surface thus exposed should not be washed or wiped, but the exuding fluid may be sopped up by a little bit of gauze. Over the raw surface, the oxide of zinc ointment, which has been diluted with glycerine sufficient to make the compound thin enough to be dabbed on with a dossil of lint, is to be freely applied without any rubbing. A piece of rag should be lightly applied over the ointment. While any inflammation remains, this treatment should be persisted in. Afterwards the oleate of zinc ointment (to be had of the chemist) may be applied, and if the disease still resist, chrysophanic acid ointment (16) should be used; or it may, as a very efficient remedy, be used in the first instance, though it is apt to irritate if incautiously applied.

Diet.

The child's diet should be nourishing but simple, consisting chiefly of milk, light puddings, and soups. Much starchy or saccharine food should be avoided.

Medicinal.

An aperient should always be given at the commencement, if there is any constipation. In any case it is well to give the red mixture (49) for four or five days to ensure the healthy action of the digestive organs. Five grains of bicarbonate of soda may be given in milk three or four times a day. Afterwards tonics, of which the iodide of iron and cod liver oil (71) will best suit most cases, are to be prescribed; but in the event of the child being comparatively robust a vegetable bitter may prove more useful (66, 69, 72), or if the child has recently suffered from any malarial affection, steel and quinine (68) is to be preferred. In cases of obstinacy arsenic (3) alone will prove of benefit. The use of pepsine (74) will often

much help the cure. When there is much itching, a dose of chloral may be given at bedtime.

4. Prickly-heat. Cause. Treatment.

4. PRICKLY-HEAT is an affection due to congestion of the skin from heat, and to excessive perspiration. The appearance is too well known to need description. As a rule, no treatment is needed further than to avoid the use of harsh flannel next the skin, but when troublesome, the ordinary dusting powder, composed of oxide of zinc and starch (11), is sufficient to effect a cure or to give relief. If not, a little powdered sulphate of zinc, in the proportion of 20 grains to each ounce of the dusting powder, may prove effectual; a lotion of borax, half an ounce in eight ounces of water, is often found very useful in allaying the irritation; but the most effectual remedy of all is a solution of sulphate of copper (10 to 20 grains to each ounce of water), which should be sopped lightly upon *a limited* portion of the affected parts after the morning bath, the lotion being allowed to dry spontaneously on the surface; but copper is a poison, and must be used very sparingly, lest enough to cause trouble be absorbed. There is no truth in the assertion that prickly-heat is a good thing, and that it should not be "driven in." The fact is that it seldom appears much upon debilitated subjects, whose skins are deficient in blood; it affects more readily the healthy integument, but in no way contributes to health; on the contrary, the function of the affected skin is, for the time being, impaired.

The fallacy that prickly-heat ought to be encouraged.

5. Herpes. Trivial kind.

5. A Vesicular Eruption, termed SHINGLES, or *herpes*, sometimes occurs. It may appear as a number of little blebs about the lips, mouth, and forehead, especially after attacks of fever, and then it is of such a trivial nature as to require no treatment. But when a patch of rather large vesicles, filled with clear fluid

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Symptoms of a more severe case.

resting upon an inflamed base, passes halfway round the body as a sort of half-belt, which seldom encroaches at all upon the opposite side, is observed, we have to deal with a case of true shingles. Of course, the eruption may be much more limited than this in extent, but its peculiarity is that it confines itself to its own side, almost never passing the spine or the breast-bone. On the fourth or fifth day the blebs dry up and form dark scabs, which fall off. The appearance of the eruption may be ushered in with a good deal of fever and general disturbance, and severe shooting pains in the neighbourhood of the rash. For a short time during the formation of the vesicles there may be a good deal of local pain, but it does not last long.

Care to prevent friction.

Treatment.

It is important to prevent children scratching and rubbing off the heads of the vesicles. If the eruption is very painful and hot, the application of cold in any shape will be found to relieve it. Mild saline laxatives such as (55), or seidlitz powders (61), or the effervescing citrate of magnesia, with occasional warm baths, and the use of a plain and somewhat low diet, will frequently be found sufficient treatment. The eruption should be protected by being dusted with the oxide of zinc and starch (11) and afterwards covered with a layer of cotton wool, the air being as far as possible excluded. Another method, if this give no relief, is to paint the rash with a collodion ; this usually relieves the pain and any tendency to itching. A course of tonics should be commenced after a few days.

6. Itch. Caused by a parasite.

6. THE ITCH is a contagious affection, dependent upon the presence of an animal parasite, which burrows beneath the skin and produces by its irritation the appearances which characterise the affection. The favourite positions of the parasite are between the

fingers, at the elbows, and on the insides of the thighs; but in young children the hands are rarely affected, the belly, feet, and ankles being selected. Intolerable itching, particularly after the child has become warm in bed, is the most annoying symptom; the scratching which results removes the tips of the minute pimples which mark the positions of the insects, and sores may be produced, which may prove troublesome to treat.

Symptoms.

A child affected with the itch should be isolated from all others. All clothes which he has recently worn should be boiled before being washed. All the affected parts of the skin should be thoroughly and liberally rubbed with the sulphur ointment (20) night and morning for three or four days. The iodide of potassium ointment is also very efficacious, and it has the advantages of having no smell, but some absorption of the iodide may take place and cause inconvenience. The child should be clad in some old flannel garments of little value, which should be destroyed subsequently.

Treatment.

7. Ringworm. Due to a vegetable parasite.

7. RINGWORM (*see* also p. 161) is also the produce of a parasite, which in this case is a vegetable. It is contagious, and appears either on the head or body. It occurs in circular patches, varying in size from that of a two-anna piece to that of a rupee. The surface of these patches is covered with scurf of a dirty whitish colour, the margins being reddish and elevated. When the scalp is attacked, the hairs break off a little above the surface, so that patches of baldness result; but when the disease is cured, the hair grows again. On the body, ringworm is easily cured, but on the scalp it is generally troublesome and persistent.

Treatment.

When situated *on the body* a small portion of an ointment made by mixing equal parts of white precipitate ointment (Ung. hyd. ammon dil.) and sulphur

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ointment well rubbed in twice a day, generally effects a rapid cure. If this fail, which is not likely, an ointment (20 grains to the ounce of lard) of salicylic acid may be substituted or the part may be painted twice a day with tincture of iodine. Occurring on the scalp of the infants and young children nothing severe must be employed. It will often suffice to cleanse the head with soap and water every night and then after careful drying to paint each patch with tincture of iodine, and after a few days use an ointment for rubbing in twice a day composed of Ung. hyd. ammon dil. or this ointment mixed with sulphur. An excellent treatment for chronic cases in older children is Hutchinson's plan. He washes the scalp twice a week with the solution of coal tar known as "Liquor carbonis detergens" (one teaspoonful to a pint of water), and twice a day a little of the following ointment, which should be obtained from a chemist, is rubbed into the patches.

Chrysophanic acid, ½ drachm.
White precipitate powder, 20 grains.
Pure lanolin, 1 drachm.
Benzoated lard, 6 drachms.
Liquor carbonis detergens, 10 drops.
Mix into an ointment.

Bazaar remedies.

As bazaar remedies, Dr. Waring recommends borax 1 drachm dissolved in 2 ounces of vinegar, for an application; or the following ointment:—Sulphate of copper powdered, 20 grains; powdered galls, 1 drachm; lard, 1 ounce; mixed thoroughly and rubbed into the diseased part. He also speaks well of the leaves of the cassia (or ringworm shrub); the plant is named by the natives dadmurdan, or dád-ká-pát. The fresh leaves should be bruised with lime juice into a thick

paste and thoroughly well rubbed into the affected part twice daily till a cure is effected. CHAP. XLIV.

Harrison gives a prescription for a *preventive pomade*, to be used by other children who reside in the same house. It is this :—

Eucalyptus ointment,
Boracic ointment,
Cocoanut oil,
} of each two ounces.
Oil of cloves, half a drachm.
Mix well together.

8. PEMPHIGUS is not uncommon in infants. In one form it may be the manifestation of a severe constitutional disease, in another it occurs as an epidemic or sporadic affection usually due to inoculation with some organism through the skin or umbilical cord. In the constitutional form the blebs occur particularly on the soles of the feet and palms, whilst in the septic form there is usually high fever and toxæmia. Both conditions commence as small red spots, the skin soon then rises into blebs, which may grow to be as large as marbles. At first the blebs are filled with clear fluid, which afterwards become opaque ; round each there may be a slightly red zone, but practically the surrounding skin is healthy. There is a little fever. When a bleb bursts, it either forms a scab, or a rather painful little sore is left. The remedies are arsenic or grey powder (3) internally, zinc ointment (17) to the sores, and a bland nutritious diet. "Unna's paste" is a very soothing application. It consists of one ounce of each of the following :—Prepared chalk, oxide of zinc, linseed oil, and lime water. But whenever possible a medical opinion should be called as to the proper treatment to pursue with. Pemphigus.

9. BOILS are too well known to need description. They are troublesome pests, difficult to relieve.

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When a boil first appears, we may endeavour to make it abort by carefully plucking out the little hair which is always found growing at its inflamed summit. Then paint the whole boil over with either collodion or "a better plan at this stage is to cover the boil with a galbanum and opium plaster (Erasmus Wilson's) spread on leather. Under this treatment pain at once ceases, the inflammation gradually subsides, and the separation of the core proceeds painlessly; when the boil discharges, a hole should be cut in the centre of the plaster, for the escape of the products" (Berkeley Hill). If the throbbing and pain be great, it will be necessary to apply a poultice, which, however, should be carefully restricted to the size of the boil itself, otherwise crops of little very painful boils are likely to appear in the neighbourhood. Before applying a poultice, it is good to smear the boil and surrounding parts with boracic ointment, or daily paint around with iodine tincture to protect them from contamination. It may become necessary to request a surgeon to incise the boil. No known medicine acts as a preventive, but tonics should be given, and of these arsenic and iron (3) are the best. A change from the plains to the hills is usually followed by speedy cure.

In chronic cases great benefit may be derived from the use after medical advice of small repeated doses of vaccines of the germ (Staphylococcus) which is causing the boils.

A vaccine may be prepared from the patient himself or $\frac{1}{3}$—$\frac{1}{4}$ of the dose of a stock vaccine prepared by reliable firms and sold in Calcutta may be injected at intervals a few times.

DIVISION X.—AFFECTIONS OF THE EYES AND EARS.

CHAPTER XLV.

INFLAMMATION OF THE EYES.

Frequency.

THIS is a common, but essentially a "military" disease, the children of other Europeans in India not being peculiarly liable to it; the soldiers' children congregate together, and the disease in its severer forms being infectious, spreads rapidly among them. Native children, too, suffer largely, particularly those of the poorer classes, who live in small huts without any means of ventilation.

Causes.

Newly-born infants are subject to an inflammation of the eyes and we have already mentioned in Chap. IV how this may be easily prevented and controlled by the use of a few drops of silver nitrate ($\frac{1}{2}$ gr. to the ounce of water), followed by gentle bathing of the opened lids with boracic lotion. Cold is capable of originating an unimportant form of the affection. Dirt, squalor, and poverty combined are the most frequent causes among native children. Debility, acting upon an unhealthy constitution, may originate a formidable sort of ophthalmia. Most cases are probably contracted by contagion.

Very contagious.

Not only is the mattery discharge of ophthalmia contagious if introduced directly into other children's eyes, as it may be by the use of a towel, common to

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all ; but the minute particles of matter which become detached, dry up, and, floating in the atmosphere, are capable of infecting other eyes with which they come into contact. A simple watery discharge is not contagious, but a yellow mattery discharge is generally highly so.

Symptoms.

The symptoms of ophthalmia vary considerably in severity. The affection usually commences with heat

Heat and itching.

and smarting of the eye, and a sensation as though a grain or two of sand had got under the lid, causing the child to rub the organ with violence ; tears flow copiously, and the thin membrane covering the white part of the ball is seen to be of a pink colour and

Discharge of water.

permeated with enlarged blood-vessels. A discharge, at first watery, but subsequently semi-thick and yellowish, causes the lids to adhere during sleep. Most cases, if properly treated, will not pass this stage ; but if the case become worse there is intolerance of light, so much so that the child will lie upon its bed with its face dug into the pillow. The eyelids are sure to swell considerably ; indeed, the upper lids may puff out like

Signs of severity.

a pair of soft balls of a purplish colour. This last-named appearance is indicative of very severe inflammation. If, at this stage, one or two little white

Ulcers of cornea.

pimples appear upon the cornea (or clear part of the eye), the case must be considered as serious, for upon bursting little ulcers remain behind, which, if deep, heal as white spots, which may interfere with clear vision. Visible blood-vessels running into the cornea show that the inflammation is very severe, and brow-

Fever.

ache is another bad sign. An amount of febrile disturbance commensurate with the inflammation is always present. When the child's eyelids are separated, profuse gushes of scalding tears, with which matter is mingled, will take place. The white spots

which remain after the healing of ulcers of the cornea usually diminish with time and as the child's general health improves.

Treatment.

In all cases of ophthalmia the most scrupulous cleanliness is a matter of the greatest moment. And the advice of the nearest competent doctor sought if the condition be severe. Almost continually, washing and bathing should go on ; in mild cases with simple warmed milk and water. A little sweet oil or soft simple ointment should be smeared upon the edges of the lids to prevent their sticking together and retaining the irritating tears or discharge in contact with the eye during sleep ; and the alum and poppy lotion (23) should be used as frequently as possible, every two hours at the least, always taking care that a drop or two gets between the lids on to the eyeball. Should it so happen that the lids adhere, no violent attempts should be made to separate them, but with the utmost patience they should be bathed with warm water or boracic lotion. The best position for bathing the child's eyes is with it lying on its back. Some wool being dipped into the warm lotion is then held so that the lotion runs from the wool on to the eye, after the discharge is cleansed away the lids are gently opened with two fingers and the lotion again let run this time between the lids on to the eyeball. This manœuvre should be repeated constantly. If the pain is very severe, and the child will not allow proper bathing, a few drops of cocaine solution (5%) should be instilled with a dropper ; this can be repeated every two or three hours when the eye should be bathed and fomented. In a severe case atropine solution may have to be instilled.

Cleanliness.

Alum and poppy lotion.

Use no force to separate the lids.

Fresh air.

The child should be encouraged to move about as much as possible in the open air, if the intolerance of

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light be not too great, the eyes being protected by a green shade; but even if there be considerable intolerance of light, the room in which the child is confined should be most thoroughly ventilated. A hot, close room will surely aggravate the disease. The diet should always be liberal, but plain. The bowels should be kept in a state of regularity by simple laxatives, active purgation is never necessary; nor are other medicines as a rule required, unless the child is manifestly below par, when a suitable tonic—such as steel and quinine (68) for children who have suffered much from the climate, a simple vegetable tonic (66, 69, 70) for those whose digestive apparatus is deranged, or the iodide of iron and cod liver oil (71) for those of unhealthy constitution—should be prescribed.

Diet, &c.

Tonics.

In severer cases.

The severer forms of ophthalmia, particularly when there is any appearance of ulceration of the cornea, require to be treated with stimulants, wine or brandy, strong soups, and the most nutritive diet which can be devised. The bowels should receive particular attention, the nature of the stools being examined, and, if found unhealthy, restored to normal condition by the red mixture (49). A tonic as above described should be given in all such cases. The child should be wholly confined to a darkened but well-ventilated room. In all cases, when possible a few drops of atropine sulphate solution four grains to the ounce of water should be dropped once a day into the eye till all acute symptoms, particularly pain and fever, have subsided.

Stimulants and tonics.

Dark but ventilated room.

Alum-wash.

Astringent drops.

While continuing the alum-wash as above described, astringent drops should be used as follows:—Six grains of silver nitrate or zinc sulphate should be dissolved in three ounces of distilled water, and each morning, after the eye has been thoroughly cleansed, the eyelids should be separated and a couple of drops of the solution

let fall upon the ball of the eye from the end of a quill or little piece of stick, which should not be allowed to approach the eye too closely lest the child should struggle and cause itself an injury.

How to obtain a view of the eye.

Great care is to be observed in opening the eye. On no account should any pressure whatever be made upon the ball ; but the thumb of one hand should rest upon the cheek-bone, while two fingers of the other are placed upon the brow ; gentle traction can thus be made from fixed bony bases, without the possibility of pressing upon the eyeball. An ulcerated eye has been burst by pressure being injudiciously made in endeavours to force the lids apart. If there is any pain in opening the lids cocaine drops should be instilled as above first.

Syringing the eye.

In cleansing the eye some recommend the use of a small glass syringe, whereby the secretions may be effectually washed out from under the lid. With adults and elder children, who may be relied upon to keep perfectly quiet, this means is very effectual ; but with younger children we should fear to recommend it, lest a struggle inflict irreparable injury. A stream of water let into the eye from a distance of a couple of inches from a small piece of very clean sponge or wool will answer sufficiently well, the lids being held apart as above described, during the process.

CHAPTER XLVI.

INFLAMMATION OF THE EAR.

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Description of ear.

THE ear, as is well known, is of the nature of a drum. There is an external curved tubular opening, which is terminated by a tense thin membrane: from the back of the throat comes the Eustachian tube, which admits air to the other side of the membrane. The first of these divisions is termed the *external* ear, which conveys the sound to the drum and causes it to vibrate: and the second, for our purposes, may be called the *internal* ear, which is also supplied with the machinery by which the sound is conveyed to the brain. When the internal ear is closed by the enlarged tonsils of a sorethroat, temporary deafness results, because the air confined in the space will bulge the drum out and prevent its free vibration.

Inflammation. 1. External ear.

1. *Inflammation of the External Ear* may be occasioned by cold, accumulated wax, by the presence of foreign bodies, or it may succeed measles or scarlatina.

Symptoms.

The symptoms are simple: a throbbing heat and itching, pain when the point in front of the external opening is pressed upon; increased pain at night, feverishness and restlessness. Moving the jaw, crying, and sneezing increase the pain. The interior of the ear will appear red and swollen, and from it, after a short time, a thick discharge is secreted. The pain greatly diminishes with the appearance of the discharge, which after a time becomes watery.

The removal of a foreign body (Chap. LI) will naturally suggest itself if any be present. Superfluous wax should be got rid of by gentle but persistent syringing with warm water, and glycerine should be dropped within the ear subsequently, still further to soften the wax for the next syringing. The child should be put upon a spare diet, and moderate purgation induced. Warm poppy-head fomentations should be assiduously employed, and succeeded by hot linseed-meal or bread poultices. The very gentle injecting of warm water will remove the accumulated discharge. But should the inflammation degenerate into a—

Treatment.

Syringing.

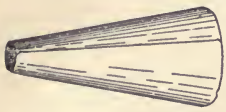
Spare diet.

Fomentations.

2. *Chronic Discharge* from the ear, it calls for very serious attention, for if it be allowed to run on indefinitely the bones inside the ear may be denuded of their covering and become diseased, thus carrying danger to the brain. A mother should never allow an ear discharge to continue, notwithstanding any tales she may have heard regarding the dangers of checking it.

2. Chronic. Requires great attention.

The ear should first be syringed for the purpose of cleansing it thoroughly, and then an examination of the tube should be made in a good light. By pulling the lobe of the ear forwards between the finger and thumb, the curvature of the tube will be removed, and a much better view obtained. A portion of a visiting card rolled into a cone, and slightly oiled on the outer side, will assist the view, if inserted gently. Should a piece of flesh (called a "polypus") be found obtruding into the tube, surgical aid alone can avail: but a foreign body, such as a pea or a piece of stone, or a quantity of hardened wax, may also be discovered. The former should be removed by the means described in Chapter LI (3),



Treatment. First cleanse the parts.

How to examine the ear.

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and the latter by repeated syringing and the application of glycerine.

Tonics.

Nearly always the general health is affected in these cases, wherefore a tonic, such as steel and quinine (68) or iodide of iron and cod liver oil (71), is needed from the commencement.

Application.

With gentleness the ear should be syringed out twice a day with warm water, to which rectified spirit of wine or boric acid has been added in the proportion of a teaspoonful to half a tumblerful, after which a drop of carbolic oil (1 in 40) or the glycerine of tannin (26) should be allowed to fall into it, or a camel's-hair pencil may be used to anoint the sides of the tube with one of these applications. In the absence of the above, a solution of alum or of tannic acid (6 grains to 1 ounce of water) may be similarly used, but as the object is to prevent decomposition of the discharges, these solutions are not so useful. Then the orifice should be gently plugged loosely with a soft pellet of wool. A single sedative draught containing laudanum (*see* Opium) may, if necessary, be given to relieve severe pain.

Blister.

Should the case still prove obstinate, a small blister may be applied behind the affected ear.

3. Inflammation of internal ear.

3. *Inflammation of the Internal Ear* is extremely painful. It is accompanied with much fever, and sometimes with convulsions. Hearing is interfered

Symptoms severe.

with, there is headache and buzzing in the ears. The orifice of the small tube communicating with the mouth becomes blocked up, the matter which forms is therefore pressed forcibly against the drum, which is very apt to be ruptured, and thus immediate relief

Management.

is sometimes obtained ; but irreparable mischief has been inflicted. In the absence of medical aid, all the parent can do is to follow the instructions given above

Seriousness of neglect.

in so far as they are likely to be useful ; but as soon as the condition is recognised, every endeavour should be made to place the child under the care of a surgeon, for not only may permanent deafness result by the breaking of the drum, but more serious injury may be inflicted by the bones becoming implicated and originating a brain affection, or causing *paralysis of one side of the face.* When the latter event succeeds a discharge from the ear, it is serious, but it is right to explain that the same symptoms may result from exposure to cold and damp, and that then the affection is comparatively trifling, tending to a natural recovery.

DIVISION XI.—ACCIDENTS.

CHAPTER XLVII.

BRUISES, BLEEDING, WOUNDS, BURNS AND SCALDS, AND SPRAINS.

(1) BRUISES.

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Cause of "black and blue" appearance.

WHEN a part is bruised it turns "black and blue," because the minute blood-vessels beneath the skin have been ruptured by the force employed, and the blood flows into the loose fat which underlies the skin. The more blood that has been thrown out, the greater the intensity of the colouration. If, in addition to discolouration, there is heat of the part, then inflammation accompanies the bruise.

Treatment.

By treatment we endeavour to prevent any more blood being effused, to prevent or allay inflammation, and to induce absorption of the blood already effused. The application of cold in the shape of ice, or of a cold lotion such as lead lotion or (13, 35), will usually effect the first and second of these objects. A piece of folded rag, saturated with the lotion, should be firmly and evenly bandaged upon the injured part. Leeches should never be applied to a bruise, they only increase all the mischief. Subsequently, when only some hardness and discolouration remain, rubbing the part once or twice daily with the soap liniment—soft soap, gr. 40 ; camphor, gr. 20 ; ol. olivæ, m. 5 ; alcohol (90%)

½ oz. ; water add 1 oz. will prove useful. Rest and elevation of the injured part should always be adopted.

(2) BLEEDING.

Means of checking.

Bleeding from wounds is usually unimportant and rarely dangerous. (1) Pressure and (2) cold are the two chief means by which bleeding may be arrested ; but there are medicaments known as (3) stypics, which are also often very useful ; and finally there is (4) the ligature.

Adaptation of edges of wound.

It is usually found that when the edges of a wound have been brought together, and the part firmly but not too tightly bandaged, all bleeding ceases, or nearly ceases ; any little oozing may be stopped by the application of cold water or ice.

Pressure of a pad.

Should these means not prove sufficient, a thick, small, hard pad of linen placed over the bleeding spot, and secured there by a firmly-adapted bandage, will nearly always completely staunch the flow. By-and-by the tightness of the bandage may be relaxed, say after two or three hours ; but should bleeding then recur, it will be necessary again to tighten it, taking care that the limb be bandaged from its extremity upwards to beyond the wound.

Wound of an artery.

Should a jet of blood spout from a wound : at once press the point of the finger upon the bleeding spot, and keep it there till preparations are completed for dressing the wound properly, when by placing the edges in apposition, and adapting a pad as above described, success will probably be attained. Cold should then be applied, and the child should be kept extremely quiet for a couple of days, during which time the pad, if removed for the purpose of cleansing and dressing the wound, should be replaced with the original care, but diminished pressure.

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Ligature may be necessary.

Should a jet of blood issue forcibly the instant the finger is removed, a ligature should be applied. By means of a forceps or pair of tweezers seize the piece of flesh from which the blood is issuing, including, of course, the bleeding orifice—a portion about so large

only, need be pinched up. Then, while still holding it tightly with the forceps, a piece of thin cord or stout silk should be passed around the raised part at the place shown by the dotted line, and tied as tightly as possible by an assistant: one end of the cord should be cut off short, and the other left hanging from the wound. In a few days it will become detached, and allow of removal.

When impracticable use tourniquet.

Should it be impracticable to apply ligature, a handkerchief should be tied around the limb between the wound and the heart, while pressure with the pad is still to be made upon the wound itself. It may be difficult to tighten the handkerchief sufficiently; in such a case, by passing a short piece of stick underneath and giving it a few twists round, tightening to any extent may be made. But it is dangerous to keep up a severe tightening for any length of time; the circulation is thus stopped, and mortification might ensue. Very severe tightening is seldom essential, and if it be, gradual loosening should be made after a short time, to ascertain how far the handkerchief may with safety be relaxed.

Danger of too prolonged constriction.

Oozing of blood.

Oozing from a cut or torn wound usually yields to the free application of cold, but should it persist notwithstanding, the surface may be sopped with a strong solution of alum or of tannin, or in case of urgency with the pure tincture of steel.

Bleeding from a vein

Bleeding from a vein is known by a copious continuous flow of dark-coloured blood. This is not of

anything like the same seriousness as bleeding from an artery. Pressure and elevation are almost always sufficient to arrest it. Should direct pressure upon the wound not prove sufficient, then pressure should be made with the handkerchief and stick between the wound and the end of the limb—that is, *below* the wound, not above it.

(3) WOUNDS.

Wounds are divided into (1) clean-cut or incised wounds, (2) lacerated or torn wounds, and (3) punctured wounds. Classified.

1. *Incised* wounds are easily treated unless they bleed much, in which case the means just enumerated are to be employed to check the hæmorrhage. The next thing to be done is to cleanse the surface most thoroughly, and to remove all particles of foreign substances, such as pieces of gravel or glass. For this purpose a stream of cold water and a piece of clean rag (not sponge) are to be used. It is a matter of great importance that the rag employed be thoroughly clean, otherwise unhealthy inflammation, or even erysipelas, may be brought on. Carbolic acid (24) or Condy's fluid should be added to the water; the strength of the carbolic solution should not exceed one part to sixty of water, indeed one to one hundred will suffice. 1. Incised. Check bleeding. Clean the surface thoroughly.

Bleeding having been checked, except perhaps some little oozing which will remain while the wound is open, the sides are to be brought accurately together. In simple cuts a strip of sticking-plaster or of court-plaster to keep the edges together will be sufficient. Sticking-plaster should never be made to encircle a limp wholly, yet the strips should be sufficiently long and broad to grasp the skin firmly. Each strip must Adapt edges.

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How to apply sticking-plaster.

be attached first to one side of the wound, then the free end is to be pulled firmly with one hand (while the other hand is employed keeping the wound together) and fixed firmly on the opposite side. Unless the cut be very small, each strip had better be about half an inch broad and sufficiently long to go a little more than halfway round the limb. When preparing the strips it is a good plan to double each upon itself and cut a piece as in Fig. A, from its centre, so that when opened it will appear as in Fig. B, the aperture being placed directly over the wound to permit the escape of any discharge and thorough cleansing. Each strip when applied should slightly encroach upon the edge of its neighbour. Then place a strip of lint soaked in carbolic lotion lengthways over the openings, and adapt a bandage over all with just sufficient tightness to support the parts thoroughly. If painful, cold water, to which Condy's fluid has been added, may be applied to the bandage. The sticking-plaster need not be removed till it has become loose, in which case the sides of the wound, if not already united, should be held together till the plaster be renewed.

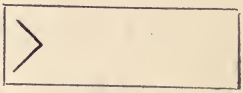

FIG. A.

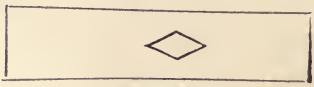

FIG. B.

Bandage.

Cold, if inflammation.

Wounds of palm of hand.

Wounds of the *palm of the hand* may be accompanied with severe bleeding. The best thing to do pending the arrival of a surgeon, is to place a hard wooden ball or a cork in the hand, which should then be closed and bandaged firmly upon the ball or cork, while at the same time the elbow should be bent as much as possible, and so retained by means of a bandage.

2. Lacerated, liable to suppuration.

2. *Lacerated* wounds seldom bleed much, but they are especially liable to inflammation and suppuration.

There may be a great deal of difficulty in thoroughly cleansing them, but this must be effectually and patiently done, the carbolic lotion (24) may be employed for the washing. But the best method is to saturate a pledget of wool with ordinary tincture of iodine and then rub the whole wounded surface with the solution. Lockjaw or tetanus occasionally follow such injuries from dirt and germs getting in to the wound. Tincture of iodine either with a brush or as above is the best method of disinfecting such a wound; before dressing it this method may be slightly painful, but it gives the best results. The deeper parts, if they cannot be got at, ought to be syringed out with the lotion. This done, we may bring the edges together with sticking-plaster as before, except that the plaster is not to be pulled too tightly, lest the escape of matter be impeded. A piece of lint, doubled twice upon itself, and saturated with carbolic lotion 1 in 80, should now be applied so as to cover more than the extent of the wound: over this a piece of plantain leaf, oiled silk, or gutta-percha tissue is to be laid, and the whole bandaged loosely.

Do not confine the matter.

Should the discharge become very free, and the wound smell, every second strip of plaster should be removed, and the wound syringed out twice daily with the carbolic or boracic lotion. Should the edges become red, livid, and pouting, the discharge being copious and offensive, it is better to remove all the dressings, and after thorough syringing to apply a large wool or lint fomentation, which can be repeated every 4 hours. When once again healthy in appearance, that is, of a bright red colour and presenting a clean surface, antiseptic water-dressing only need be applied.

Syringe with carbolic lotion.

A poultice may be necessary.

3. *Punctured wounds*, that is, wounds which are produced by sharp, long, narrow instruments pene-

3. Punctured.

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trating the flesh, such as might be caused by treading upon a nail, or falling upon a splinter of wood, are often troublesome. The great thing is to allow the orifice to remain completely and freely open, not necessarily to the air, but for the free discharge of matter. Of course, should any portion of a foreign substance remain imbedded in the wound, every endeavour should be made to remove it with the forceps, the orifice being enlarged for that purpose if necessary. Boracic or carbolic lotion should then be injected into the wound, and carbolic water-dressing applied; and when healing, a folded piece of lint should continually but loosely cover the aperture.

Allow free exit to matter.

Inject carbolic lotion. Poultice.

Carbolic oil.

(4) BURNS AND SCALDS.

Great constitutional shock.

Burns and Scalds.—A severe burn or scald is chiefly dangerous on account of the shock it occasions to the whole system. The great pain is accompanied with violent shivering, a pallid face, and cold hands and feet.

Dangerous situations and times.

The amount of danger to be apprehended from an injury of this kind is dependent, of course, upon its extent, but the depth to which it has penetrated is also of importance. The nearer burns are to the centre of the body the greater the danger, and the most dangerous period is the first five or six days after the accident. But it is not only the immediate danger that has to be considered; there are others of a more remote nature to which the accident renders the child liable; these are, ulceration of the bowels on about the tenth day, producing serious inflammation of the abdomen; and inflammations of the head or chest, which may occur a little later on.

Remote dangers.

Treatment, objects of.

In treating a burn there are three matters requiring immediate attention, *viz.*, to relieve the pain, to counteract the shock, and to protect the injured surface

from contact with the air. *If the patient be seen immediately* after the accident, give a dose of wine into which laudanum to the extent of one drop for each year of age has been put. Then the instant application of a saturated solution of bicarbonate of soda will relieve pain on the spot and prevent blistering. This remedy is only of use if employed without any delay ; wherefore, if the soda be at hand, it is better not to wait to make a solution, but moisten the soda a little and smear it on as a paste, adding water drop by drop subsequently. *If the above cannot be done*, either on account of delay in seeing the case or the absence of soda, deluge the parts with carron oil (which is made by shaking together equal parts of lime-water and any bland oil, such as sweet or linseed oil, till they form a thick white emulsion) ; use sweet oil alone. It is most desirable to use some antiseptic with the oil dressing ; this can be best done by mixing one part of eucalyptus oil to four parts of carron or olive oil. Eucalyptus is a powerful antiseptic and a good deodorant.

Administer a stimulant with opium.

Apply soda.

Apply carron oil.

Application should be antiseptic.

Whichever application is used, the whole part should be at once enveloped in large quantities of cotton-wool, kept in position by very lightly-applied bandages. Should the burn be very severe, and when seen, the clothes are scorched and sticking to the child, it is best to at once immerse the whole body in a warm bath, and then when they have unstuck somewhat, cut or take the garments off, the bath has the effect also of combating the severe shock.

With cotton-wool.

Bath

The child should be put to bed as soon as possible, with hot bottles wrapped in blankets applied to his feet and sides. More wine may be administered if the shivering and depression continue, and as soon as possible a little warm beef-tea should be given.

Warmth.

More stimulant if necessary.

Beef-tea.

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Cut off the clothing.

The greatest gentleness is required in handling the child lest the injured surface be abraded. The clothes should be removed by cutting them off with a pair of scissors, piecemeal, taking care not to expose a large surface to the air at any one time.

Prick the blisters.

When blisters appear, they are to be pricked with a needle, great care being taken not to remove the elevated skin.

Length of time the first dressings remain. Mode of dressing.

The first dressings are not to be removed till necessity obliges for cleanliness sake ; every time the surface is dressed, there is, of necessity, a fresh exposure to the air, the very thing we wish to avoid. In removing the dressing, if the surface injured is extensive, the removal and renewal should be done piecemeal. The less often the burn is dressed the better ; and before the old dressings are removed the new ones ought to be quite ready to be put on.

Caution as to over-stimulation.

It may be necessary to repeat the administration of stimulants once or twice within the first twenty-four hours, but reaction will by that time probably have been fully established, and therefore we must be very guarded in the exhibition of wine lest the excitement produced prove injurious.

Subsequent dressings.

The carron oil may be employed till the healing be well advanced, when the zinc ointment (17) or resin ointment (21) may be substituted for it, an occasional change for a day or two to a turpentine application (22) being often beneficial.

Proud flesh.

Should granulations often called proud flesh, elevated above the line of the skin, form, such should be touched lightly every second day with the solid bluestone (sulphate of copper). The liability to contractions occurring during the healing of a burn should always be kept in mind. A limb should invariably be bandaged in the straight position.

Position of the limbs.

Mr. Swain considers the *collodium flexile* of the Pharmacopœia to be "by far the best local application for burns. This should be painted on smoothly with a large brush. It will frequently prevent vesication, if it has not already taken place. If there are vesications, the serum should be let out through small openings, and the surface painted over with collodion."

(5) Sprains.

Nature.

A sprain is a twist of a joint, which stretches and perhaps partly tears the ligaments which bind the bones together.

Symptoms.

Upon the occurrence of the accident there is a sickening pain experienced, and there is inability to bear weight upon the limb; swelling succeeds, and perhaps the skin becomes "black and blue." If a sprain be neglected, chronic inflammation of the joint may succeed, which may result in permanent stiffness of the part.

May inflame joint.

Treatment.

The great principle upon which a sprain is to be treated is, rest. As soon as possible after the accident, immerse the injured foot or hand in a basin of hot water for ten minutes, and then in a basin of cold water for a similar period. Then apply a wet bandage rather tightly from the toes or fingers well up beyond the injury; put the child to bed, and insist upon the most perfect rest. The bandage should be wetted at intervals with water or the lotion as in the case of a bruise; and when the acute inflammation has passed away, a plantain leaf or piece of rubber protective is to be applied over all to prevent the injured part becoming dry too rapidly. When all pain and inflammation have subsided, the joint should be rubbed with a stimulating liniment. Caution should be observed in allowing the child to resume play.

CHAPTER XLVIII.

SNAKE-BITES, STINGS OF INSECTS, AND BITES OF ANIMALS.

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As the annual Indian Records show that every year some thousands of people in India die from the effects of snake-bite, it is safe to assume that many more thousands are bitten and do not die. We, therefore propose, to lay before our readers an easy identification table, which has been found in practice to work admirably by one of us. For it cannot be gainsaid that the shock and alarm after any given snake-bite are very potent factors in prognosis and recovery. Therefore, if the miscreant snake is before one and dead, it should be possible with the following scheme, to definitely say, whether it is poisonous or not and thus be able to take steps towards either active treatment or the allaying of the patient's misgivings.

In the scheme it will be seen that there are only four groups of poisonous land snakes in India, and therefore it is only necessary to master the few marked features of each group to be able to identify—

(1) Whether the snake is poisonous.

(2) What group it belongs to.

Having satisfied oneself as to these two factors, it is unimportant to discover the exact sub-species beyond those that are mentioned, though reference to the classical work* of Major Wall, I.M.S., would give the necessary data.

* The poisonous terrestrial snakes of British India by Major Wall, I.M.S., C.M.Z.S. Published by the *Times of India*. Price Rs. 2.

POISONOUS SNAKES: THEIR EASY IDENTIFICATION.

Definitions.

Scales covering head and body are called shields.

The more important shields are :—

(*a*) Supra labial, bordering upper lip.

(*b*) Infra labial, bordering lower lip.

(*c*) Nasal border nostrils.

(*d*) Internasal, between nostrils.

(*e*) Ventrals, cover belly.

(*f*) Vertebrals, down middle of back.

(*g*) Costals, cover sides.

(*h*) Parietals, large and behind a line drawn between the eyes.

There are only four groups of poisonous land snakes in India and Burma and these groups have two common features, besides those mentioned below—

(1) Tails round and not flattened.

(2) Ventrals or belly shields which stretch right across, or so far across that only part of the last costal row can be seen when the snake is laid on its back. *Vide* diagram.

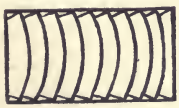

Fig. 1.

All poisonous sea snakes have flat tails.

Group I.

Kraits.

Comprises twelve species of Kraits characterised by :—

(1) Round tails.

(2) Medium row of scales down back (Vertebrals) distinctly largest. See fig. 2.

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(3) Iris black except in banded Krait which is yellow.

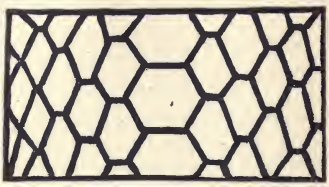

FIG. 2.

(4) Only four Infralabials and the 4th the largest. Commonly found are :—

(1) Banded Krait or "Raj" Samp of Bengal. Banded yellow and black, grows about 6 feet, virulent, but not often fatal to man.

(2) Common Krait or "Chitti" of Bengal, has white indistinct banding, most marked posteriorly. Without immediate treatment rapidly fatal to man.

GROUP II.

Cobras.

Comprises Cobras and Coral snakes ; these both show (1) round tail ; (2) the 3rd Supralabial touches the eye and nasal shields as in fig. 3. In addition in the Cobra (1) between 4th and 5th Infralabials there is a small wedge called the "Cuneate." *Vide* diagram.

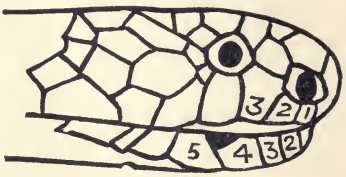

FIG. 3.

(2) Do not be misled by seeing no hood ; a dead stiff Cobra may show none. The Burmese variety shows on the hood an oval mark surrounded by an ellipse. The Indian Cobra shows a "spectacles" mark on the hood.

These Cobras rarely grow beyond 5 feet. Some Cobras have no hood marks.

The Hamadryad or King Cobra grows to 15 feet and is distinguished from ordinary Cobras by having a pair of large shields in contact with one another behind the parietals. *Vide* diagram 4.

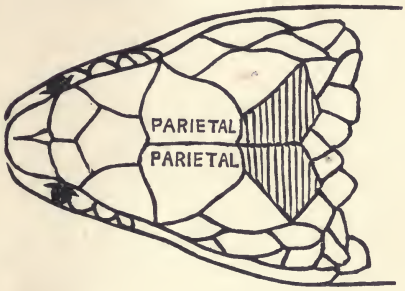

FIG. 4.

All varieties very virulent to man.

Coral snakes belong to this group ; they have besides the two features mentioned above, usually coral pink or barred bellies. They are not fatal to man.

GROUP III.

Comprises Pit Vipers only ; that is, snakes charac- Pit Vipers. terised by :—

(1) Round tails.

(2) An easily seen opening on the side of the face between the eye and the nostril, called the Loreal opening. *Vide* diagram 5.

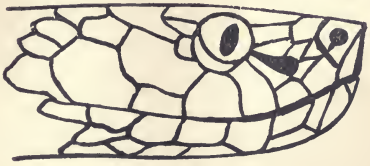

FIG. 5.

(3) Found mostly in hilly districts.

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(4) Do not grow beyond 3 to 4 feet long.

(5) Colour usually greenish, black or brown.

(6) Poison effects are severe, but usually only local that is around bitten area.

A common example of this group is the Green Viper or Bamboo snake.

Group IV.

Pitless Vipers.

Comprises Pitless Vipers characterised by :—

(1) Round tails.

(2) Snout and crown covered with small scales similar to those seen on back.

(3) Eye diameter greater than distance from eye to nostril. In this group two are commonly met with :—

(1) The little Indian Viper or "Echis" known in Sind as "Kuppur," in Delhi as "Afai." It is very common and probably one-third of all bites are fatal to man. This snake has a peculiar habit of double coiling itself ; then inflating its belly, it rubs the coils together making a hissing noise. Its colour is a dark sandy brown.

(2) Russell's Viper, the "Mwe Bwe" of Burma, the "Jessur" of Bengal. It grows to 5 feet in length. Colour buff with three longitudinal series of spots down back, and on the head is a well seen pink V with apex at snout. Is very fatal to man.

Fayrer's directions.

Having identified the snake or not, the following remarks as to treatment are summarised from Sir J. Fayrer's work :—

(1) Apply ligature.

(1) Apply at once a ligature of cord around the limb, about two or three inches above the bite.

Twist with stick.

Introduce a piece of stick under the ligature, and by twisting tighten it as much as possible.

(2) Three other ligatures.

(2) Apply two or three other ligatures above the first one, at intervals of a few inches, and tighten them also.

(3) Scarify the wound, by cutting across the tooth-puncture to the depth of a quarter of an inch, and let it bleed freely. (3) Scarify.

(4) Apply either a hot iron or live coal to the bottom of these wounds, or better still rub in either pure Condy's fluid, or the raw crystals of potassium permanganate. If these are not to hand, one may allow a few drops of pure carbolic to fall into the incisions. (4) Burn the wound.

(5) If the patient himself, or any one else, will suck the wound forcibly, while the fire or caustic is being obtained, so much the better. (5) Suck the wound.

(6) If the bite be on a part where a ligature cannot be applied, pinch up the skin over the bite, and cut out a circular bit as large as the finger-nail, and from ¼ to ½ an inch in depth. Then to the raw surface apply a live coal, carbolic or potassium permanganate (Condy) as stated, or explode gunpowder in it. (6) If ligatures impossible, cut out part and burn.

(7) Keep the patient quiet, but administer brandy and sal volatile every quarter of an hour, to the extent of three or four doses. Intoxication should not be induced. Strong black coffee is the best stimulant in all cases. (7) Quiet. Brandy. Sal volatile.

(8) Should no symptoms of snake-poisoning appear in half an hour, the ligatures should be relaxed, or the parts will mortify from the strangulation. If, however, poisoning symptoms appear, the ligature should not be relaxed until the patient is recovering, or the parts become cold and livid. (8) When to relax ligatures.

(9) If the patient become low, apply mustard poultices and hot bottles. Encourage and cheer the patient, stimulate him throughout. Keep him quiet, and do not make him walk about. (9) Mustard poultices and hot bottles. Cheer patient.

In some cases the wound oozes blood for hours. The same treatment should be adopted as above. A

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good astringent for local use is two teaspoonfuls of powdered alum to a tumbler of water.

(10) Should there be bleeding from the gums, an astringent mouth wash followed by a few doses of calcium chloride grains ten, water one ounce, will usually stop it. Or in a severe case it may be necessary to give ten drops of adrenalin in a wine glass of water every hour for six hours. Fayrer has recorded many instances where serious symptoms of prostration have been wholly due to fear, the snake which had inflicted the bite having been killed and proved to be harmless. There is, too, another hope: an exhausted snake, one which has recently bitten at other objects, is but feebly poisonous for the time, though perhaps deadly by nature.

Symptoms due to despair.

Snake may be innocent or exhausted.

Severe measures necessary.

"The measures suggested are, no doubt, severe, and not such as under other circumstances should be entrusted to non-professional persons. But the alternative is so dreadful that, even at the risk of unskilful treatment, it is better that the patient should have this chance of recovery."

Stings of Venomous Insects.

In young children may not be altogether unattended with some danger.

Treatment.

Tie a ligature above the place if possible. Extract the sting if it can be seen, suck the wound, and then apply liquid ammonia, which will at once relieve a *wasp* sting. Sal volatile will also answer, but not so quickly. If neither is at hand, use a strong solution of bicarbonate of soda or carbolic oil. If swelling has already set in, do not use the ammonia, but the soda solution on a rag.

Mosquito bites are relieved by the application of oil of peppermint, and the oil of eucalyptus is a good pre-

ventive. For the inflammation which sometimes follows these bites a poultice of ipecacuanha powder and mint leaves is very good, or ipecacuanha alone made into a paste.

For *scorpion* stings or *spider* bites, ligature as above, suck the part and apply a drop of carbolic acid. If the acid be put into a little cut made into the punctured spot, so much the better ; afterwards poultice with ipecacuanha paste. Sal volatile and brandy should be given if there is faintness in any of the above cases.

Bites of Animals.

Needless alarm.

But a very small proportion of dogs or other animals which bite people are affected by hydrophobia ; and even of all persons who have been bitten by undoubtedly rabid animals, not a quarter suffer from hydrophobia.

When a bite is inflicted through clothing, it is not nearly so dangerous as when a naked part has been bitten.

Animals liable to hydrophobia. Dog should not be killed.

The dog, the jackal, the wolf, the cat, and the fox are the only animals known to suffer from hydrophobia. A dog which has bitten a person should not be killed at once, because it will then be impossible to determine whether the animal really was or was not mad at the time of the attack,—a matter which may be decided very soon if the dog be tied up and allowed to live.

Treatment. Suck the wound. Ligature. Burn or caustic or excise the part.

Immediately after the bite the wound should be well sucked. Caustic should then be applied, a little water dressing put on, and no more thought of the matter. If, however, there be evidence that the dog is mad, and if the patient be seen immediately, the best thing to do is to proceed precisely as directed under Nos. 3, 4, 5, and 6, for the treatment of snake-bite, except that the ligature need not be kept on longer than after the application of the cautery or caustic, nor is it necessary to apply

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The caustic must penetrate to the bottom of wound.

more than one ligature. A thin stick of caustic inserted directly into the bite down to its bottom is an excellent proceeding. A stout iron wire, heated and driven to the bottom of each tooth wound, is also an effectual mode of cauterising the wound ; strong carbolic acid, if it penetrate to the very bottom of the wound, is equally efficient, and much less painful. It must be recollected that the wound is much deeper than that inflicted by the snake, and that, therefore, the incision must be deeper, and the caustic very effectually applied.

Pasteur's treatment.

The friends of a patient who has been bitten by a rabid animal should at once send him to the Pasteur Institute at Kasauli or Coonoor and the sooner the better, because the results attained are proved to bear a ratio to the quickness with which treatment is begun. The course extends over a fortnight.

There can be no doubt as to the success of M. Pasteur's grand discovery, which has been the means of saving many persons from premature and painful death. In the event of the wound not having been energetically treated without delay at the time the bite was inflicted, it becomes a matter of special anxiety to subject the patient as speedily as possible to Pasteur's treatment.

CHAPTER XLIX.

FRACTURES.

Signs of fracture.

A BONE is known to be fractured when there is unnatural mobility in its length, when there is such deformity of the limb as could not occur unless the bone were broken, and by the sensation of grating produced by the broken ends rubbing together when the limb is grasped both above and below and slight movement made.

Caution as to movements.

When it is suspected that a bone is broken, the greatest care must be taken, lest by incautious movements one of the ends be made to penetrate the skin.

Management at moment of occurrence.

The moment after the accident the limb should be gently drawn down as nearly to its natural position as may be done without using much force; and if the patient is at any distance from home, a dozen or so straight bamboo twigs should be cut and rolled in grass or pieces of cloth (a native's puggary, for instance, torn into pieces), and placed at intervals around the limb, and there secured by tying them with a couple or three pocket-handkerchiefs moderately tight. This done, the child may with safety be carried home, and a surgeon summoned. The straw cases in which wine bottles are usually packed serve excellently for these temporary splints, one being placed at either side of the fracture.

If surgical aid not available.

Assuming that it be not possible to obtain surgical aid:—The child having been placed upon a perfectly level and rather hard bed, an assistant should grasp

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"Set" the fracture.

the sound part of the limb above the fracture, while the operator gently and slowly but firmly pulls from the lower end in the straight direction of the limb, that direction which is natural to it, all jerking being avoided. The limb is thus brought into its natural position, a fact which may be verified by comparison with the opposite limb. The sooner after the occurrence of the accident that reduction is made, the more easy will it be of accomplishment.

Apply splints.

The next step is to retain the injured limb in the natural position to which it has been reduced, by means of splints, which must be sufficiently firmly applied to insure immobility, while pressure on prominent points must not be too great. The most simple form of splints consists of pieces of thin light board cut to about the length of the broken bone. One of these well padded, should be placed at either side of the broken limb, and if desired, a third may be placed behind for it to rest upon. With three straps or pieces of bandage they should be bound firmly, but not too tightly, in position around the limb.

Objects of treatment.

If the broken bone has been reduced to perfect position, and if it be, during the remainder of treatment, retained in this position without the possibility of any movement, nothing further is required; Nature will do the rest.

Splints not to be moved till union has taken place.

It may be necessary to tighten the straps or bandages from time to time: but the splints should not be removed, or even loosened, for ten days or a fortnight, and not even then except in case of necessity. It will be necessary to wear splints for about three and a half weeks.

Inflammation subdued by cold or irrigation.

Inflammation in the neighbourhood of a fracture is to be subdued by the application of cold lotions, or ice, or by irrigation (that is, a basin of water is to be

placed on a stand higher than the limb ; into the water is put a skein of cotton, which is allowed to hang over the edge ; the water will drop rapidly from the cotton upon the part, producing great cold.)

Many fractures require special treatment.

These directions are of the simplest nature ; many fractures require special apparatus, but the limits here available do not permit of more than the most general allusions to the subject. In all cases it is very desirable that a surgeon should inspect a fracture as soon after its occurrence as possible, even though a few days should have to elapse.

Compound fractures.

A compound fracture, that is, when the broken bone has penetrated the skin and made a wound which communicates with the break, is to be treated in the same way—by reduction and splints—the wound being treated upon general principles (*see* Wounds), the most important of which is thorough cleansing with carbolic lotion or Condy's fluid solution in the first instance, or better still with tincture of iodine as mentioned above, and then carefully applying an antiseptic dressing. In these cases the very greatest care should be taken that all dirt is removed, and that the neighbourhood of the skin wound is clean. Spirits of wine is the most efficient cleanser of the skin. All dressings which are applied must be sterilised by being boiled in a kettle for 10 minutes and then when cool applied. If the most rigorous care be not taken, the child may lose the limb or life from gangrene or acute poisoning. In every possible case surgical aid should be called to a compound fracture.

CHAPTER L.

INJURIES OF THE HEAD.

CHILDREN bear blows upon the head with extraordinary impunity as compared with the adult.

Not so serious in childhood.

A severe blow will render a child giddy and confused, or it may completely stun him. A very severe blow may produce insensibility of a most serious nature, the child lying cold, clammy, and pale, with a feeble, slow pulse, and an eye insensible to light.

Symptoms of concussion. Trivial and severe.

After a time, varying with the force of the blow from a few minutes to perhaps several hours, he begins to revive, the skin becoming warmer and the pulse stronger. Then vomiting, which is always a good symptom, sets in, and sensibility gradually returns. Of course, improvement may not take place, the patient may go on from bad to worse, or there may be partial recovery, succeeded by symptoms of inflammation of the brain (*see* Head Symptoms, p. 334).

Treatment. Initiate reaction.

At first the child should be laid in a warm but well-ventilated place, mustard plasters should be applied to the calves of the legs, the arms and body should be rubbed with brandy or turpentine or a stimulating liniment (18). A couple of grains of calomel are to be placed upon the back of the tongue ; a purgative enema (44, 45) administered, and cold applied to the head (13, 35, and p. 172).

Purge. Cold to head.

Upon revival a warm drink, but no brandy.

So soon as symptoms of revival set in, give a warm drink of tea or milk, or a little sal volatile may be given with water. *Do not administer brandy or wine.*

An aperient powder (56) may next be given, and the rest of the treatment resolves itself into perfect quietude in a darkened and cool room, a very light and simple diet, preserving the bowels in a state of laxity, and keeping cold to the head, until the child has completely revived. For some time subsequently care should be taken to prevent the child joining in active or boisterous play, to keep the bowels open, to avoid exposure to the sun, to maintain a simplicity of diet, and to keep him from school.

Aperient. Quiet in dark room. Purging.

Subsequent precautions.

Should inflammation of the brain occur, the treatment should be conducted as laid down on page 337.

Still more serious injuries may occur to the skull should the child fall from a height or be struck by a falling object. In such cases there may be bleeding from one or both ears, or from the nose or under the eyes ; the base of the skull may be fractured or there may be dinting or fissuring of the vault of the skull together with laceration of the skin. In such cases, the child rapidly sinks into a comatose condition, the breathing is of a snoring nature, and a fatal result may quickly ensue. If there be splitting or dinting of the vault of the skull, only immediate competent surgical aid will save the child and trephining will be necessary, together with thorough cleansing of the wound. If there be bleeding from the ears, the base of the skull is probably fractured ; the ears should be very gently syringed with a weak carbolic or boracic lotion, and the ear then gently plugged with gauze or wool which has been boiled and is sterile. The patient should then be placed gently in bed, and the treatment as of concussion adhered to until improvement occurs. In all such cases early medical opinion should be at once sought.

CHAPTER LI.

ACCIDENTS WITH FOREIGN SUBSTANCES.

(1) Swallowing Foreign Substances.

Rounded substances not serious.

MARBLES, plum-stones, and such like rounded substances are frequently swallowed by children, but such an accident need not cause alarm. The substances thus swallowed will become impacted in the fæces and pass with the ordinary stools. In these cases it is not a good plan to give aperient medicines ; on the contrary, a diet of a constipating nature ought to be adopted, so that the substance may become impacted and be thus carried along the bowel. Purgatives delay the expulsion by rendering the fæces so fluid that they pass over the heavier substance, which subsides and remains stationary as a local irritant.

Avoid purgation.

Substances of injurious nature.

Emetic, if seen at once.

A button, a copper coin, or other smooth substance which is likely to produce harm because of its nature, may safely be removed by an emetic, if we learn of the accident immediately after its occurrence, and sulphate of zinc (41) is the best medicine to give, but mustard will also answer very well (*see* Emetics). If too long a time has elasped to allow of the emetic being of use, or if the substance be pointed or angular, we must treat the case on the constipation plan, astringent medicines being employed if necessary. The chances of injury ensuing will then be slight.

Otherwise encourage constipation.

A pin swallowed.

It is a common occurrence that a pin placed in the mouth, accidentally slips down the throat. "Not unfrequently this happens with children ; and the mother

in her anxiety to do something, immediately doses the little patient with castor oil, and *then* seeks medical advice. In such an accident it is far better to avoid purgatives; and rather allow the patient to eat plentifully, so that the foreign body may have the best chance of being carried through the intestinal canal, imbedded in and surrounded by fæculent matter. It were better to encourage costiveness than establish relaxation of the bowels" (Geo. Pollock).

Purgatives dangerous.

Encourage constipation.

Should it happen that any substance has stuck in the back of the throat, the occurrence will be notified by immediate symptoms of distress and alarm. In such a case the child should be placed with its face to a good light, its mouth having been opened, a piece of cork or wood should be placed between the back teeth and the substance looked for. If it can be seen, it may be grasped with a forceps and removed. If it is not visible, it should be felt for with the finger passed well down the throat, and if detected, it may be worked loose if it be a small object such as a fish-bone or the like; or sickness may be induced by putting the finger down the throat, and thus the offender may be ejected, or an emetic may be given with the same object.

When a substance sticks in throat.

Use forceps.

Or finger.

Or emetic.

(2) Foreign Substances in the Air-Passages.

Instead of passing into the gullet or stomach passage, the substance may enter the windpipe or passage to the lungs. Fortunately the air-passage is so effectually guarded by a peculiar valvular arrangement that such accidents are not common, but they are always serious.

Happily infrequent.

There is, when the accident happens, an immediate sense of impending suffocation, the difficulty of breathing may be most intense, and a spasmodic cough occurs. Sudden death may possibly happen. When the

Most serious symptoms.

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substance has taken up its permanent position, a calm ensues, and the subsequent symptoms will depend upon the position occupied ; but they are sure to be very distressing, and fraught with danger.

Treatment.

Unfortunately there is nothing that can be relied upon as efficient treatment within the power of the parent. Instantly a surgeon should be informed of the occurrence, with a view to his performing an operation if necessary.

Send for surgeon.

Invert the body.

In the meantime place the child upon its back upon a small table, and standing at its feet, grasp them against the edge and turn the table up, the child's head being thus downwards, till nearly at right angles to the ground. When in this position let an assistant endeavour to excite vomiting by passing a feather into the throat ; and then turning the child partly over, while still in the hanging position, let him be slapped firmly upon the back. These measures failing, after a full and fair trial, it is best to put the child to bed in whatever position it seems most at ease, and await the surgeon's arrival.

Excite vomiting.

Slap the back.

Do not attempt too much.

(3) Foreign Substances in the Ear, Nose, and Eye.

Violent efforts unjustifiable.

Foreign substances should be removed from any of these situations, provided no pain be occasioned to the patient in doing so. "When it is remembered that if left alone the foreign body generally becomes loosened, and escapes without surgical interference of any kind, we have a very strong argument against the adoption of any means involving suffering" (Holmes Coote).

The ear-tube.

The *ear*-tube is widest at its outer part, it narrows in the centre, and as it approaches the drum it again becomes wide. The most common cause of earache

is wax in the ear and the pain may come on so suddenly that the parent may think there is some foreign matter present. In these cases, a few drops of glycerine and olive oil placed in a salt spoon and warmed over a match should be instilled into the ear. This may be repeated two or three nights running, the ear being gently syringed with boracic lotion in the morning. Severe earache may be greatly relieved by placing a little blotting paper at the bottom of a wine glass and then adding a few teaspoons of pure chloroform and applying the wine glass firmly against the head over the ear for ten to twenty minutes. The vapour of the chloroform makes the ear glow, and at once relieves the pain. This can be repeated every hour. It is more beneficial than fomentations in many cases by bringing blood to the part. As a child seldom manages to introduce a substance beyond the narrower portion, great care must be taken not to thrust it further back in the efforts at removal, for not only is the difficulty of extraction then greatly increased, but by pressing upon such a delicate membrane as the drum, ulceration and penetration may possibly occur, and the substance passing into the internal ear may there cause inflammation, or even disease of the bone.

Danger of pushing past the narrower part.

Seeing that such serious consequences may possibly happen, and that nevertheless there is not the slightest need for hurry or alarm as to immediate consequences, the best plan, when far from medical aid, is to make gentle efforts to remove the substance, and, these failing to send the child to a surgeon. If the substance be visible, and if it present a rough surface which can be grasped, it may be extracted with the forceps. In the case of a small and round substance, the effects of position may as well be tried, by placing

No need for hurry, therefore only gentle efforts to be made.

With forceps.

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Position.

Syringing.

the child upon its side upon a table, and then raising the legs of the feet end about one foot from the ground. Or success may be obtained in many cases by instilling into the ear a few drops of laudanum or cocaine solution (5%), and then with the child in a good position and light, passing a very fine probe which at a distance of an eighth of an inch from its end is bent at right angles, the probe then is passed behind the object and is used as a hook to extract the foreign body. Neither of these simple plans succeeding, it is better to restrict further efforts to the use of the syringe. First drop some oil into the ear, and insert a small pledget of cotton, saturated with oil, gently into the orifice. Three or four hours having elapsed, the wax will have become softened; then some warm soapsuds are to be injected with moderate force, rather in the upward direction, in the hope that the stream getting behind the substance will force it out of the ear, as it very frequently will do.

Occasionally small insects enter the ear, such as flies, or gnats and the buzzing occurring greatly perturbs the patient. This may be at once cured by placing a little pure chloroform in a wine glass and bending the child's head and ear in contact with it over the glass. The vapour of the chloroform kills the insect and stops the pain, the animal should then be removed by syringing.

The nozzle of the syringe should not be introduced within the ear, but should be held a short distance off the orifice.

The nose.

Foreign substances in the *nose* cannot excite the same dangers as in the former situation. "Let it be remembered that, in children especially, there is no cause for anxiety or haste; the extraneous body will work its own way out, the surrounding parts receding

so as to widen the passage by which it entered" (Holmes Coote). A discharge from the nostril must of course occur, and it will probably be of a fetid, mattery nature, necessitating the use of a little Condy's fluid lotion. Unless the substance can be grasped, and removed by the forceps, it is better to wait quietly till the services of a surgeon are obtained. There is not the slightest need for hurry.

The substance will loosen itself.

If not removable by forceps do not interfere further.

Sometimes it can be removed by employing cocaine and the probe as described above for the ear. At other times by syringing forcibly down the opposite nostril to that affected, and telling the patient to breathe deeply through the mouth it may be dislodged by the stream of lotion as it discharges from the affected nostril.

The eye.

Insects, dust, etc., are best removed from the eye with a moistened camel's-hair brush, or the moistened corner of a silk handkerchief. If the offending body is beneath the upper lid, stand behind the seated patient, place a wooden match horizontally over the middle of the lid, which should then be everted by gently taking hold of the eyelashes and turning the lid upwards, when the offender will be seen and may be wiped off.

CHAPTER LII.

RUPTURE.

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Definition.

By rupture is meant a protrusion of a portion of intestine through the muscles of the belly, causing a soft swelling underneath the skin.

Varieties.

There are two common localities of rupture—(1) at the navel, and (2) at the groins. Children are sometimes born with ruptures.

1. Navel rupture.

Either at the time of birth or shortly after the separation of the navel-string, a soft, round swelling may be observed at the navel. The swelling subsides when the child is placed upon its back, but a fit of crying or sneezing will cause it to reappear. Gentle pressure with the fingers will push back the protrusion out of sight, and then probably the circular edge of the opening through which it has passed may be felt with the tip of the finger. There is no pain of any kind.

Symptoms.

Groin rupture.

Groin rupture is usually confined to male children. The mother notices that the scrotum of her infant is of unusual size, that it is soft, compressible, and often semi-transparent. At times, when the child is at rest, the swelling wholly disappears, again to show itself when he cries.

Prospects.

There is usually no danger attending these cases in infancy, but if not then cured by simple mechanical means, they are apt to remain permanent throughout life, a remark which especially applies to groin rupture; and they are sure ever afterwards to be a source of continual annoyance, and sometimes of danger.

Treatment. 1. Navel rupture. Properly arranged pad.

The domestic management of navel rupture is simple. A pad made of a flat piece of thick guttapercha covered with two or three folds of linen, should be secured to the centre of an elastic binder, and should be continually worn night and day around the belly: that is all that is required. A convex pad should never be used, because, although it pushes the bowel back more effectually, it at the same time pushes into and enlarges the opening, instead of helping it to close. After a few months, recovery will probably be complete, the aperture having closed up.

Another simple home method is to sew up a rupee in a piece of lint. This is then applied over the rupture and a piece of strapping (sticking plaster), round the abdomen used to help keep it in place.

2. Groin rupture not so easily managed.

A groin rupture is not so simply managed. Here there is no need for great hurry, and therefore, even if there be a delay of a few weeks, it is better to wait for the opinion of a surgeon, because there are one or two easily-cured affections of the parts involved which closely resemble rupture—so closely that the mother cannot discriminate. A long delay should never be permitted, because it is only during infancy that cure without operation is possible. Sometimes cure is obtained by using a two-inch flannel bandage, with a pad of wool over the site of rupture. But this should not be used for longer than six months. Trusses are expensive and often not effective; moreover, they have to be changed frequently as the child grows, in size, and in this country cause much chafing of the skin. If they are used, the skin should be daily bathed under the truss with spirits of wine and then powdered. If the case is pronounced to be rupture, the instrument-maker will, upon the precise measurements, etc., being supplied to him, furnish a proper truss, an apparatus

Surgeon's opinion to be obtained.

Curable during infancy without operation.

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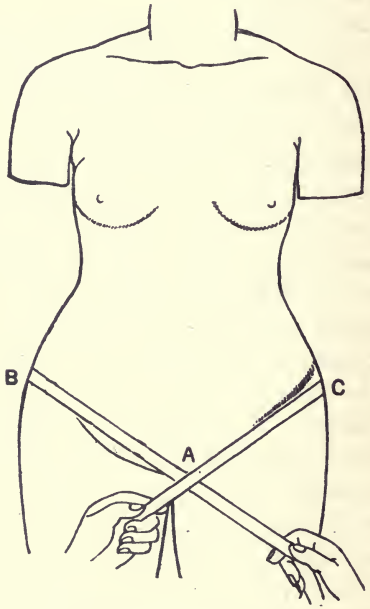
which is essential to efficient treatment. To measure for a truss, it is necessary to take the girth of the child round the pelvis, as in figure below which is the same for child or adult from the point A round the points B & C & back to A ; and state what side the rupture is on, right or left and whether it is big or small. A surgeon may cure the case permanently by operation. A truss should never in any case of a child be used after the age of 4 years. This is the best time for operation, and the results are always excellent. It is



to be remembered that a child if not operated on, cannot later enter any public service, and that his health may be severely endangered by obstinately denying operation for him.

CHAPTER LIII.

ACCIDENTAL POISONING.

Classification.

POISONS are of three kinds :—

1. Corrosives, which have a local burning action.
2. Irritants { metallic / vegetable / animal } which cause local inflammation.
3. Narcotics which act chiefly on the nervous system.

Examples.

Examples of *corrosives* are : corrosive sublimate, the mineral acids, ammonia, lunar caustic, and chloride of zinc ; of the *irritants :* arsenic, antimony (metallic), croton oil (vegetable), and cantharides (animal); of the *narcotics :* opium, chloral, strychnine, aconite, and numerous others.

Symptoms.

The symptoms of the *corrosives* are : burning pain of the mouth, gullet, and stomach, extending soon over the whole belly ; mouth bleached inside ; vomiting, it may be of bloody mucus ; the abdomen swells, and collapse comes on. Of the *irritants :* after an interval, a burning constriction of the mouth, gullet, and stomach, which latter is tender to pressure ; nausea, thirst and vomiting follow, generally accompanied by purging and fever ; the pulse fails, and the body becomes cold and clammy. Of the *narcotics :* some produce deep sleep (opium, chloral, camphor), some noisy delirium (belladonna, camphor), others cause convulsions and cramps (strychnine, nux vomica, arsenic), and so on.

General remarks on treatment.

In most cases the object is to EMPTY THE STOMACH quickly and thoroughly. The parent is confined to

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emetics for this purpose, though the stomach-pump is the most effectual of all, by not only emptying but repeatedly washing out the organ. In most cases of corrosive poisoning, the use of the stomach-pump is not permissible *in any hands* because the gullet and stomach are so softened and eroded that they might be perforated. Even of emetics, the amateur is precluded the employment of that one (apomorphine) which is the most certain, because it must be used hypodermically and in very minute doses to be safe. A dose by the mouth which would act, would be dangerously depressing. In the same way he is precluded the use of strychnine and other powerful remedies. These disabilities all point to the necessity for the speedy attendance of a medical man, but much may be done meanwhile. The best substitutes will be suggested where there are these difficulties.

Emetics.

Mustard (a heaped tea or dessert-spoonful) in tepid water, given repeatedly, is a good and quick emetic. The sulphate of *zinc* (5 to 15 grains), or sulphate of *copper* (2 to 4 grains repeated) dissolved in water are also most useful and reliable. *Ipecacuanha* is too slow, but may be used when others are not available.

Antidotes.

ANTIDOTES are remedies which unite with poisons to form harmless substances. Examples: arsenic with dialysed iron or magnesia; the mineral acids with chalk or lime; tartar-emetic with tannin or tannin containing substances, as catechu, bark, etc., corrosive sublimate with white of egg or milk. Epsom salts in solution is an antidote to carbolic acid poisoning, and oil is subsequently given to relieve the pain. But many of the *vegetable poisons* cannot be dealt with in this direct way. We get rid of them as far as possible by rapid emetics, and then we give medicines which have effects antagonistic to the poison. Examples: for

strychnine poisoning we use chloral after emetics, for belladonna cases we give opium after emetics, and for opium poisoning we use belladonna after emetics ; for aconite poisoning, after emetics we give digitalis and stimulants to keep the heart and respiration going, and so on. Strong tea and coffee precipitate the active principle (alkaloids) of many vegetable poisons.

When alcohol is recommended, take care not to induce intoxication. General advice.

An emetic promptly given is always admissible.

When writing for the doctor, state the case as fully as you can, to enable him to bring the proper remedies and appliances.

"Never regard a case as hopeless. In every case, if you see the patient at once, and have the requisite appliances at hand, there is a good chance of recovery."*

"Do not relax your endeavours because at first your efforts appear unavailing. You may have to work for three or four hours before there is much improvement."*

"Do not leave your patient alone, even when he has apparently quite recovered. Often enough, as the circulation improves the symptoms reappear, probably from re-absorption of the poison."*

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* "What to do in Cases of Poisoning," by Dr. W. Murrell. A little book which is a model of brevity and mastery of the subject.

SOME SPECIAL POISONS,

ARRANGED ALPHABETICALLY, WITH THEIR SYMPTOMS AND TREATMENT.

Name and how taken.	Symptoms.	Treatment.	Remarks.
ACIDS, MINERAL. (Sulphuric or vitriol, nitric, and muriatic or hydrochloric.) By mistake for something else.	Violent burning pain in mouth, gullet, and stomach. Vomiting of shreddy membrane and blackened blood. Thirst. Constipation. Loss of voice. Difficult breathing. Mouth and throat white or yellow coloured. Collapse.	Chalk, soda (washing soda if no other), carbonate of potash or magnesia—diluted and given freely. Wall-plaster and water. Soap and water. Seize the nearest remedy. Half a dose of laudanum. All food by bowel. Drinks of olive oil, white of egg, barley-water, or arrow-root.	These are "corrosives," but if taken diluted they are only "irritants." Then not nearly so dangerous. Any alkali is an antidote. May be immediately dangerous by causing swelling of the throat and suffocation.
ACONITE, or MONKSHOOD. Liniment in error. "Pain-killer." Root mistaken for horse-radish.	In three minutes a tingling, numbing pain of mouth, lips and tongue. Numbness of the skin. Often retching. Paralysis first of the legs, then of the arms. Failing pulse and respiration. Collapse. Mind clear throughout.	Mustard (or zinc) emetic. Alcohol and sal volatile. Mustard plaster over heart. Tincture digitalis. Dose, 5 minims each ½ hour, thrice (for child of five) in water. Recumbent position and absolute rest. Friction to the limbs. Artificial respiration (p. 24.)	Real horse-radish is white, has a pungent odour when scraped, and the scraped surface remains white. Aconite root is brown, has no odour, and the scraped surface soon becomes pink. N.B.—Aconite is often *combined with belladonna* in liniments. Treatment then as above.

Ammonia. Liniment in error. "Liquid ammonia." "Compound camphor liniment."	Burning of mouth, throat, chest and stomach. Mouth bleached inside. Cough. Bloody saliva escaping. Voice lost. Pulse falling. Cold limbs. Danger of suffocation.	Vinegar largely diluted, freely. Followed by draughts of olive oil, melted butter, white of egg with water or barley-water. Half an ordinary dose of laudanum. Tracheotomy sometimes necessary.	Vinegar (it may be "toilet") is the antidote.
Antimony. Tartar emetic, pure or ointment. Antimonial wine mistaken for sherry.	Incessant vomiting, faintness, and clammy perspiration. Burning of throat and stomach. Violent purging. The vomit and stools may be bloody. Cramps and collapse.	Emetic of mustard or zinc if vomiting deficient, followed by draughts of water. Tannic acid, 10 to 15 grains in water, repeated if vomited (tincture of bark, catechu, or even strong tea), followed by white of egg and barley-water. Half a dose of laudanum *when recovering*. Enema of peptonised milk and raw beef with brandy.	Four or five grains of the ointment, or half an ounce of the wine would be dangerous to a child. Tannin (or anything containing it) is the antidote.

SOME SPECIAL POISONS—(*contd.*)

Name and how taken.	Symptoms.	Treatment.	Remarks.
ARSENIC. Fowler's Solution. "Rough on Rats." Fly-papers. Arsenical soap White arsenic used by builders.	In ½ hour, faintness, nausea and burning of stomach. Vomiting which may be tinged with blood. Cramps in legs Great thirst. Belly tender. Straining and bloody purging. Clammy skin. Collapse.	Emetic (mustard or zinc) followed by large draughts of water. Dialysed iron (a dessert-spoonful or more) well diluted and repeated; or, in its absence, carbonate of magnesia, or olive oil freely. Barley-water and white of egg with water. Large dose of castor oil. Hot blankets and bottles. Frictions.	Less than a grain might be fatal. Fowler's solution contains 1 grain in 100 drops. If *no dialysed iron at hand*, mix carbonate of soda with tincture of steel, and filter through a handkerchief. Of the moist remainder give freely to the patient.
BELLADONNA, or ATROPINE. Eye-drops in error. Liniments. Extract of belladonna. Berries of the plant.	Dryness and heat of throat, flushed face, great thirst, widely dilated pupils, mirthful delirium, staggering gait, deep sleep.	Emetic (mustard or zinc). Brandy, sal volatile, chloric ether. Half a dose of laudanum. Tannin, freely. Strong tea or coffee (mouth or enema). Artificial respiration.	Known as "deadly nightshade." Children bear large doses well. When *belladonna and opium combined* in a liniment are taken, treat as for opium (which see).

CAMPHOR Eaten from lump for colds. Essence or spirit of camphor.	Odour of breath, giddiness, faintness, delirium, cold, clammy skin. Difficult breathing. Deep sleep. "No pain, no purging, no vomiting" (Murrell).	Emetic (mustard or zinc), followed by draughts of water and brisk purgative. Sal volatile and chloric ether at intervals. Warm blankets and hot bottles. Cold and hot douches to head and chest.	Alcohol not to be given by the mouth if solid camphor has been taken, because it would dissolve it. May give brandy by enema if necessary.
BURNETT'S FLUID.		*See* Zinc.	
CARBOLIC ACID. Lotions in error. Dressings and oil by absorption. Injections for worms.	Burning of mouth. Inside of mouth white and shrivelled. Odour from breath. Cold, clammy skin. Lips and eye-lids livid. Urine inky-coloured. Pupils contracted, deep insensibility.	A couple or three teaspoonfuls of Epsom salts in tumbler of water. Then emetic of mustard or zinc. More Epsom salts at intervals. Follow by olive oil and castor oil mixed, and white of egg in water, freely. Stimulate with brandy, sal volatile and chloric ether.	Whitla recommends washing out the stomach with pure glycerine, using a soft tube, but this could only be done by a skilled person.

SOME SPECIAL POISONS—(*contd.*)

Name and how taken.	Symptoms.	Treatment.	Remarks.
CAUSTIC, LUNAR.		*See* Silver.	
CHARCOAL FUMES (Carbonic Acid Gas). Charcoal fires in closed apartments.	At first headache, giddiness and drowsiness, succeeded by insensibility, with a livid face.	Removal into fresh air. Ammonia at short intervals to nostrils. Stimulants by mouth or bowel. Electricity. Artificial respiration.	Common among the natives of India.
CHLORAL. Sedative syrup. Patent medicines.	At first a natural sleep, which deepens into coma. Livid face. Failing pulse. Low temperature (Murrell says it may fall to 91°). Pupils contracted at first, afterwards dilated.	Emetic of mustard or zinc. Sal volatile, alcohol and ether as stimulants. Hot bottles and blankets applied. Strong hot coffee as enema. Rouse patient by talking and shaking. Electricity. Artificial respiration.	A few grains might prove dangerous to a very young child.

COPPER. Sulphate of copper (blue stone) lotion. Copper cooking utensils (verdigris).	Metallic taste, constriction of the throat, vomiting, griping and straining, purging, jaundice. Difficult breathing, great thirst, insensibility, and perhaps convulsions.	White of egg and milk, freely. Emetic of mustard or Ipecacuanha if vomiting deficient. Mucilaginous drinks. A single dose of laudanum. Poultice abdomen.	The proper "tinning" of cooking utensils is important. Acids should not be cooked in copper vessels. This is not a likely cause of acute poisoning. A sufficient dose acts as an emetic.
CORROSIVE SUBLIMATE. Lotion in mistake, or ointment.	Metallic taste and feeling of constriction in the throat. Pain in stomach. Vomiting of bloody mucus. Bloody purging. Pulse very weak and rapid. Skin cold and clammy. Urine suppressed. Convulsions.	Emetic of mustard or zinc. White of egg with water, copiously. Failing eggs, use flour and water, or milk and lime-water. Stimulants as required.	The lotion has the appearance of water, and very little taste.
CROTON OIL. Mistaken for castor oil. Liniment swallowed.	Severe pain in stomach. Copious watery purging. Vomiting. Face pale. Faintness. Cold skin.	Emetic of mustard or zinc. Drink freely of barley-water or white of egg and water, or arrowroot. Stimulants (brandy, sal volatile and chloric ether). A half-dose of laudanum. Linseed poultice to stomach.	

SOME SPECIAL POISONS—(*contd.*)

Name and how taken.	Symptoms.	Treatment.	Remarks.
DALBY'S CARMINATIVE.		Treat as for Opium (which see).	Given innocently.
FLY-PAPER.		*See* Arsenic.	Chewing the paper, or drinking the water in which it lies.
FOWLER'S SOLUTION.		*See* Arsenic.	Mistake for something else.
GIBSON'S VERMIN-KILLER.		*See* Strychnine.	Mistake, or curiosity.
GODFREY'S CORDIAL.		*See* Opium.	Given innocently.
HYOSCYAMUS (Henbane).		Treat as for belladonna.	Overdose.

IODINE. Tincture or liniment.	Pain and burning in the throat and stomach. Vomiting and purging. Faintness; possibly convulsions.	Starch (arrowroot, or any flour) in water freely (given raw). Emetic of mustard or zinc. Repeat the starch. A small dose of opium if much pain	Not often fatal. The vomited starch-water will be blue.
LEAD. Sugar of lead is sweet. Goulard's extract. White lead mistaken for chalk. Lotions swallowed.	Metallic taste. Great thirst. Severe colic relieved by pressure. Constipation. Cramps. Cold sweats, and convulsions.	Emetic (mustard, zinc, or ipecacuanha), zinc the best because it is an antidote too. Dilute sulphuric acid 10 to 15 minims in glass of water repeatedly; or Epsom salts in water freely. Milk and white of egg to follow. Poultice belly. Half dose of opium. Afterwards iodide of potassium in mixture	Not at all so poisonous as is generally supposed.
LUCIFER MATCHES		*See* Phosphorus.	The heads may be eaten in silly play.
MORPHIA.		*See* Opium.	

SOME SPECIAL POISONS—(*contd.*)

Name and how taken.	Symptoms.	Treatment.	Remarks.
MUSHROOMS.	In ½ hour or more colic, followed by vomiting and diarrhœa. Pulse becomes very weak. Mental excitement Insensibility.	Emetic of mustard, zinc, or ipecacuanha. Tincture belladonna (5 drops every ½ hour for three doses to a child of five). Castor oil. Stimulants (brandy, sal volatile or ether). Warmth to surface. Poultice belly.	
NITRIC ACID.		*See* Acids, Mineral.	
NUX VOMICA.		*See* Strychnine.	
OPIUM. Solid lump. Laudanum. Soothing syrups. Batley's solution. Enema. Poultices or liniments by absorption. Dover's powder. Compound Kino powder.	Pupils contracted. Face livid. Skin dry. Insensibility, which becomes very deep with heavy breathing. This is succeeded by great prostration, shallow breathing, and general clammy perspiration.	Emetic of mustard or zinc. Strong coffee or tea liberally. Rouse him by shaking and slapping. Pour cold water over the head at intervals. Tincture of belladonna (5 drops to a child of five, every ½ hour for three doses). Wash out stomach with potas. permang. 2 grs. to pint of warm water. Artificial respiration.	Often *combined with belladonna* in a liniment, then treat as for opium, but do not administer belladonna. Infants are very easily affected by opium. Two drops of laudanum, and one grain of Dover's powder have caused death.

OXALIC ACID. Mistaken for Epsom salts. "Salt of sorrel" for removing iron mould.	Burning pain in throat and stomach, vomiting of bloody matter, imperceptible pulse, and great depression. Mouth may be white inside	Chalk, whiting, or lime freely with water. The saccharated solution of lime in half teaspoonful doses frequently in water is the best. Castor oil and olive oil afterwards.	Very poisonous. Must *not* give the alkalies (potash and soda) as they form poisonous compounds with the acid. The purely acid taste might attract a child.
PAIN KILLER.		*See* Aconite.	
PHOSPHORUS. Rat-paste poison. Match-heads.	Burning pain in the stomach. Vomiting, which may contain blood. Delirium. Deep insensibility or convulsions. The patient may recover the local symptoms, the graver symptoms not appearing for a couple of days.	Emetic—copper the best, as it is also an antidote. Repeat it Turpentine purgative ($\frac{1}{2}$ drachm with mucilage, followed by Epsom salts (54).	All oily and greasy substances to be avoided when treating a case.
RAT PASTE POISON.		*See* Phosphorus.	
ROUGH ON RATS.		*See* Arsenic.	

SOME SPECIAL POISONS—(*concld.*)

Name and how taken.	Symptoms.	Treatment.	Remarks.
SALT OF SORREL.		*See* Oxalic Acid.	
SIMPSON'S RAT-PASTE.		*See* Strychnine.	
SILVER, NITRATE OF (LUNAR CAUSTIC)	Vomiting of white, flaky matter, which turns black on exposure.	Common salt in water or milk, repeatedly, in large quantities. Emetic after first draught. White of egg with water freely afterwards.	A small quantity taken is rendered harmless by the gastric juice. The antidote, salt, acts in a similar way.
Portion falling down throat during an application.			
STRYCHNINE.	Convulsions and lockjaw; body bent backwards. Countenance wildly excited. Pulse rapid and small. Respiration difficult.	Emetic of mustard or zinc. Tannic acid in water, given copiously. Bromide and chloral (8 *b*) by bowel, and repeated to keep the convulsions in abeyance. Artificial respiration.	The active principle of nux vomica. One-sixteenth of a grain has killed a child of two. Twenty grains of a nux vomica nut would be dangerous.
Mistaken for santonin or salicin. Some rat poisons (Simpson's paste, Butler's vermin killer).			
SULPHURIC ACID.		*See* Acids, mineral.	

TARTAR EMETIC.		*See* Antimony.
TOBACCO (including Lobelia).	Nausea, vomiting and faintness. Confusion of sight. Clammy skin and weak pulse.	Emetic of mustard. Tannic acid, 10 grains or so in water frequently, or strong tea. Stimulants — brandy, sal volatile, and chloric ether Warmth to surface of body. Recumbent position.
VERMIN KILLERS.		
Battle's.		*See* Strychnine.
Butler's.		,,
Gibson's		,,
Simpson's.		*See* Arsenic.
Roth and Ringeisen's.		*See* Phosphorus and Arsenic.
Rough on Rats.		*See* Arsenic.
ZINC CHLORIDE.	Corrosion of lips and mouth. Pain and burning of stomach. Constant vomiting of bloody fluid. Difficulty of swallowing and breathing Quick, feeble pulse, deep insensibility.	Carbonate of soda in large quantities dissolved in warm water (common washing soda will do). Milk and white of egg very freely. Tannic acid or strong tea. A dose of laudanum. Linseed poultice to stomach.
Burnett's fluid.		
Disinfecting fluid.		

PART IV.

On the Administration and application of Remedies to Children.

CHAPTER LIV.

ADMINISTRATION OF REMEDIES.

Medicines may usually be supplanted by dietetic and other means.

It has often been said, and with great truth, that the less medicine children take the better. A carefully regulated diet, together with attention to the other details of general hygiene, are the surest means of attaining this desirable end. As a matter of fact, drugs are very seldom necessary, in any form, throughout childhood, if the general management be good.

In childhood, drugs specially powerful.

But drugs and proper medical treatment are especially powerful for good in the sicknesses of childhood. Very many of the diseases of early life may be arrested by the simplest means, if taken in time.

Patent medicines.

Patent or other medicines of unknown composition should never, under any circumstances, be given to a child. Only drugs which may be administered with absolute safety should be thought of.

Drugs affecting child through mother's milk.

It occasionally happens that drugs taken by the mother are excreted in the milk in sufficient quantity to have an injurious effect upon the infant. The drugs which appear in the milk in this way are the salicylates, belladonna, atropine, arsenic, potassium iodide and bromide, the saline purgatives, and possibly opium and morphia.

Whatever medicine is considered necessary should be made to occupy the smallest possible bulk, and pains should be bestowed upon making it as little objectionable in taste as is compatible with its nature.

Medicine small in bulk.

Opiates are especially dangerous in the case of infants; so much so that the amateur should never, under any circumstances, give even the most minute dose of any opiate in any form to an infant under six months of age, and after that age *only* as directed in the foregoing pages, where it will be observed that on every occasion upon which opium is recommended, a special caution as to the exact dose and mode of administration is inserted. Godfrey's Cordial or Dalby's Carminative should never be permitted within a nursery. They and other preparations of the same class contain opium.*

Opiates. Danger of.

Patent "soothing medicines.

Mercury is only recommended in one form and for one purpose, namely, calomel, in a moderately purgative dose. No other preparation of mercury for this or any other purpose should ever be used by non-professional persons. Grey powder, which is, or was, such a favourite in the nursery in England, is especially to be avoided in India, because under the influence of climate it becomes changed in its nature into an actively poisonous

Mercury.

* "Godfrey's Cordial is made of infusion of sassafras, treacle, and tincture of opium. It contains about one drachm of the latter in six ounces, or half a grain of opium in an ounce. Half a teaspoonful has been known to cause the death of an infant. Dalby's Carminative is composed of essential oils, aromatic tinctures, carbonate of magnesia, and tincture of opium. It contains one-eighth of a grain of opium in every ounce. Forty drops has been known to kill an infant. Half a teaspoonful of Paregoric Elixir has been fatal to an infant." SWAIN'S *Surgical Emergencies.* "*It is said on good authority that* 15,000 *children are killed every year by soothing-syrups and other similar preparations.*" (Murrell).

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substance. Powders containing calomel and soda should be made up freshly as required. By long keeping some of the calomel is changed into corrosive sublimate.

A few words concerning the remedies advised in these pages may be here inserted with advantage :—

Alteratives.

"ALTERATIVES are medicines which promote secretion and exhalation generally, soften and loosen textures, check inflammation, lessen inflammatory effusions, and promote re-absorption" (Tanner).

Action of.

In fact, they are remedies which change diseased action by acting on the blood. Only three alterative formulæ have been entered among the prescriptions, and concerning them there is no need for further instructions than those mentioned under each. Of course the dose of any medicine containing arsenic must be carefully regulated, and care taken that it be administered immediately after food ; but it is so valuable a drug, and in the shape of Fowler's solution it is so manageable that it would not be right to exclude it. It may be employed with perfect safety by following the prescriptions (3). Half a minim to one minim thrice daily in water is a proper and quite safe dose for a child of one year.

Caution as regards arsenic.

Applications.

A number of APPLICATIONS are mentioned, the mode of employment of each being explained in the text. There are, however, a few others, which perhaps need some comment. *Poultices*, for instance, are frequently employed. By softening the skin they relieve tension and pain. In the early stages of an inflammation they favour resolution by maintaining the temperature and promoting active circulation through the part. Before any poultice is applied, the skin should be oiled to prevent sticking. A pure mustard poultice should never be applied to a young child ; it is too strong, and is likely to blister, and therefore should be

Mustard poultices.

diluted with twice or three times its quantity of flour or linseed. The effect of this remedy in relieving abdominal and chest pain is extraordinary, and can hardly be accounted for by the fact that the temporary congestion of the skin draws away blood from the neighbouring affected part. About a quarter of an hour is a sufficient time for a diluted mustard poultice to remain on. A linseed poultice prepared with $\frac{1}{6}$ to $\frac{1}{8}$ of its quantity of mustard may be retained for some hours.

Ordinary poultices.

The linseed or other simple poultice may be applied to the surface after the removal of the mustard poultice, to perpetuate its action, or it may be employed alone. A linseed poultice retains its warmth longer than a bread poultice (see also p. 278).

Blisters and leeches.

Neither blisters nor leeches should ever be applied to a child except under the direct medical advice.

Violet powder.

Violet powder or a dusting powder of some kind is necessary as an application to the child's skin, particularly in India. The common corn-flour makes an excellent dusting powder, but a combination of equal parts of oxide of zinc and powdered starch is the most useful of all (11). Ordinary violet powder obtained from a respectable chemist answers all purposes admirably, but it is not a good plan to purchase the article from the boxwalla, for it has been proved that adulteration in its worst form has of late included violet powder. Professor Foster discovered no less than $4\frac{1}{2}$ grains of arsenic in 100 of some powder purchased from "a respectable chemist in the north of London," and shortly before that a wholesale poisoning through skin absorption occurred in London.

Caution as to.

Fomentations.

Hot-water fomentations are very useful in many cases. The water should be as hot as the patient can bear it. Two thickly folded and large flannels should

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be used, one being removed from the hot water and wrung out should be applied to the part; after an interval of two or three minutes the second should be similarly applied upon the removal of the first, and the process continued for half an hour if possible.

Turpentine stupes.

Turpentine stupes may be applied by sprinkling a little turpentine upon the flannels when they are wrung out of the hot water, before application, as above.

Cold and Unctions.

Of the application of cold to the surface of the body we have already spoken, but it may here be advisable to reiterate the importance of cold bathing or sponging or wetpacking in conditions of high fever, restlessness or delirium. The child should be sat in a tub of water at about 90°F. and then be sponge douched over head and shoulders. The water being very gradually cooled down to about 60° by the addition of ice or cold water. This should last about ten minutes. The child should then be removed and placed in bed with a hot bottle to its feet, and it may be necessary as well to give a few drops of brandy and water if the child is exhausted. The cold pack also is very often invaluable to allay fever and restlessness. Place a rubber sheet on the bed and then ring out a blanket or sheet in water at 60°F., and wrap the child round in it for ten minutes, placing a wet towel on the head at the same time. Oily frictions to the skin have also been alluded to, and we have spoken of the great benefit in weakly children of rubbing the body daily with cod liver oil.

Carbolic applications.

Applications containing carbolic acid are to be used cautiously with children, who are very susceptible to its influence; it may be absorbed rapidly into the system. The first sign of such absorption is an inky tint of the urine. In such an event the use of the acid should be at once suspended and boracic acid substituted. If more be used, its poisonous effects will be set up.

Throat applications.

In making applications to the throat, a large soft camel's-hair brush, securely fixed to its handle, should be used and it should be pushed well down the throat, while the head is thrown well back, deliberately and cautiously, with a rotatory motion, so as to distribute the application over all the parts.

Vapour bath.

The vapour bath is valuable in cases of dropsy. The child, quite naked, should be seated upon a cane-bottomed chair ; a blanket, reaching to the ground on all sides, should then be thrown around the patient, and tied at the neck, so as to leave no aperture. A "*chattie*," or other open vessel of boiling water having been placed under the chair, sweating soon commences, and it should be kept up for a quarter of an hour at least. The child should then be rapidly and thoroughly dried, and put into a warm bed. Another plan is to conduct steam beneath the bed-clothes, which have been raised from the body by arching a couple of bamboo twigs across the bed underneath them, through a hollow bamboo or india-rubber tube from the spout of a kettle ; but care must be taken not to allow the jet of steam to impinge directly upon any part of the body.

Hot and warm bath.

A hot pack performed in the same way as a cold pack only using very hot water is also an admirable method of inducing perspiration in cases of dropsy or collapse.

A hot bath usually has a temperature of about 104° to 106°, and the warm bath a temperature of 98° or 100°. To be of use, the water should be deep enough to reach to the child's arm-pits. It is not of any consequence whether drying be effected completely, but it is important that it be done rapidly. The child should be wrapped in a blanket and put to bed, whether with or without his night-dress matters not, but a garment should be warmed previously to being put on.

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Irritation and pain are thus subdued, and probably perspiration induced.

Mustard bath.

A mustard bath is used in certain cases of threatened collapse. It is prepared by using mustard in the proportion of one ounce to each gallon of warm water. To ensure equal diffusion, the mustard should first be made into a paste, and placed in a muslin bag, through which it should be squeezed into the water.

Anthelmintics.

ANTHELMINTICS are medicines which have been proved to possess the power of destroying the life of intestinal worms ; or so weakening and intoxicating them as to render them powerless. That remedy which is poison to one kind is harmless to another, hence the absurdity of the so-called worm tablets, lozenges, etc.

Antispasmodics and sedatives.

ANTISPASMODICS *and* SEDATIVES are most important medicines. Of this class the bromide of potassium is an effectual and at the same time a perfectly safe medicine for the parent to handle. With it harm can hardly be done, unless there be utter recklessness and disregard of the effects it produces. Strictly speaking, it ranks more as a sedative, a guardian against spasm, rather than a means of relieving it on the moment. While taking the bromide, an infant should be kept under observation, because its continued use sometimes produces a skin eruption. In most cases this amounts only to the appearance of red blotches, which soon vanish upon the cessation of the medicine, but on rare occasions the points of local inflammation are so great as to produce a sort of wart-like growth which disappear slowly, and may cause a good deal of suffering. Chloral is a most powerful sedative, but it is one which must be used with caution ; the dose advised in prescription No. 8 is perfectly safe, and it is one which may be repeated

Bromide of potassium.

Chloral.

after six or eight hours if there is necessity. When given in combination with bromide of potassium it acts more powerfully. Sulphonal is a most valuable hypnotic, producing lengthened and refreshing sleep. "Its advantages are that it is tasteless and does not derange the digestion, nor seriously depress the circulation or respiration." It is best given in hot soup or water. It does not dissolve in cold water, but if dissolved in boiling water it will not fall down again on cooling to a point at which it can be drunk. It has the disadvantage that it is not always certain to produce the desired result, or it may be long in doing so. One efficient dose in 24 hours will suffice. The dose for a child of five would be about 5 grains; and for a child aged two about half that quantity. Trional is a more modern drug, and in many respects it is superior to sulphonal, especially in that it acts more rapidly and with greater certainty. It is especially valuable in night terrors and where sleeplessness is due to nervous disturbance. It is useless where sleeplessness is due to pain; it does not disturb mental, respiratory, or circulatory functions, and acts beneficially rather than otherwise on digestion. The dose for under one is 1 to 2 grains; from one to two years of age, 3 or 4 grains; from two to six years, 4 to 6 grains; from six to ten years 8 to 10 grains. It usually acts within ten minutes, and may be given in warm milk, or, better still, in jam or honey. A drink of any warm fluid immediately after the dose greatly facilitates its action. Ether is a pure antispasmodic; the sulphuric ether (called also "spirits of ether") in doses of 3 to 6 drops to a child; the spirits of chloroform (also called "chloric ether") is another preparation of ether, of great value and power as a stimulant antispasmodic: it may be

Sulphonal.

Trional.

Ether.

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given in doses of 1 to 2 drops to a child a year old.

The ordinary sweet spirits of nitre is another and excellent antispasmodic when given in doses of 5 to 10 minims. It also acts as a sweat-producer and urine-increaser, as will be presently shown.

Carminatives.

CARMINATIVES rouse the nerves of the stomach and relax its orifices, allowing eructations of gas to escape, and relieving spasm. They are therefore very useful for flatulence, and when combined with aromatics and soda they are of great value, both in colic and certain kinds of diarrhœa. Some formulæ have been inserted to enable the parent to make suitable carminative fluids from bazaar sources; but the distilled waters (if really made by distillation) as obtainable from the chemist are always to be preferred.

Value of.

Bazaar carminatives.

Astringents. Much abused.

ASTRINGENTS constitute one of the best known and most abused of all classes of remedies. They vary much in their mode of action, and consequently the kind of case for which it is proposed to employ an astringent must always be carefully discriminated before its administration; for instance, chalk acts mechanically by coating the delicate mucous membrane, and thus protects it, and it is also an antacid; therefore when the irritant is removed, chalk acts beneficially. Sugar of lead, on the other hand, is a pure and direct astringent, contracting the smaller vessels and tissues, and preventing them pouring out fluid; hence it is used in violent watery discharges from the bowels and to check bleeding. The mineral acids, lead, oxide of zinc, tannin, and catechu are intestinal astringents. Opium, catechu, and tannic acid affect the stomach; while digitalis, ergot, and cold influence the blood-vessels.

Bael fruit is classed among the astringents, but it is almost more an alterative, its astringent powers being but slight. "In irregularity of the bowels, presenting alternations of diarrhœa and constipation, one draught (see prescript. No. 33) taken early in the morning often exercises a most beneficial effect in regulating the bowels," says Waring, who issues the following caution :— Bael.

"In bazaar specimens, the wood-apple (fruit of the *Feronia elephantum*) is often substituted for Bael. Though they bear a close resemblance externally, they can easily be distinguished by opening them. In the true bael there are in the centre of the pulp a number of cells, from five to eighteen each, containing one or more seeds and glutinous mucus, whilst in the wood-apple there are no cells, and the seeds are imbedded in the pulp." Spurious articles sold.

When the fresh fruit is not procurable, the liquid Extract of Bael or the Dietetic Bael can be obtained from the chemist.

Ice is useful as a local astringent. It should be tied in a bladder, and so applied. In its absence the freezing mixture may be substituted with nearly equal results (35). Ice and freezing mixture.

DIAPHORETICS create perspiration. It is seldom that a very young child perspires freely under any treatment, or during any sickness. There is moisture, but not perspiration. By promoting the skin action, internal congestions are obviated, and the circulation thereby relieved. The warm bath used in conjunction with this class of medicine much helps their action. Diaphoretics. Infant seldom perspires freely. Action of. Assisted by warm bath.

The most common, and perhaps the most useful diaphoretic, is the sweet spirits of nitre, in doses of from five to ten drops every few hours to a child a year old and twice that quantity to a child who is above two years. It should never be given undiluted, and usually it is combined with other medicines, Sweet spirits of nitre.

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which experience has proved to assist in producing the desired end. The amount of urine secreted is also considerably increased by the use of the sweet spirits of nitre (otherwise called "spirits of nitrous ether").

Nitre.

Common saltpetre or nitre, or nitrate of potash, is a valuable diaphoretic, and it has the advantage of being obtainable in the bazaars, under the name of shórá. To be fit for internal use it should be pure, in large white colourless masses, and possess a saline cooling taste.

How to purify it.

If impure, "to fit it for internal use, it should be purified by dissolving it in boiling water, removing the scum after the liquid has been allowed to settle, straining the solution through calico, and setting aside to crystallise" (Waring).

Mindererus' spirit.

The solution of acetate of ammonia is the old and well-known "spirits of mindererus," a bland and mildly efficient diaphoretic, which may be given in doses of from twenty to sixty drops, but it is never prescribed alone.

Antifebrin.

Among this class we have included *antifebrin*, a very important and highly useful drug. Dr. Mitchell Bruce says of it that it is "powerful, safe, and convenient," but it has the disadvantage that it will not dissolve in water, though it is soluble in wine. For further information about it refer to page 188. Valuable as this drug is in individual cases, a routine treatment of fever by its aid is much to be deprecated, and cannot be compared for efficiency and innocency with the employment of the cold bath for the same purpose.

Emetics. Uses.

EMETICS are medicines which are used to produce vomiting. They are given when we wish to empty the stomach of its contents, to depress the patient temporarily, and to augment secretion and excretion.

When precluded

Emetics are precluded when there is great debility.

This class of medicines is especially useful in the diseases of children, because so much less distress results from their employment than in the case of the adult.

Cause little distress in children.

Unless there is urgency, and that immediate vomiting is desired, an emetic should not be given in too large a dose at first. To obtain the full effect it is best to repeat the dose every ten or fifteen minutes till vomiting is induced, and it is also desirable to administer it before the usual hour of rest, because the sleep and perspiration which follow the action of the medicine are thus perpetuated; but, of course, it is not always that there is choice in this matter.

How to administer.

At the beginning of croup, when convulsions are threatened, and in commencing inflammations of the lungs, emetics are invaluable; also in bronchitis and obstruction of the throat with mucus in croup and whooping-cough, etc.

Value of.

The most common emetics are ipecacuanha, mustard, alum, sulphate of zinc, and sulphate of copper.

The most common.

Ipecacuanha is a universal medicine. In the case of infants it is best to employ the powder, but for older children the wine is more convenient: a grain of the former, or a teaspoonful of the latter, given every quarter of an hour till vomiting results, is the usual and best means of employing the drug. Ipecacuanha also assists expectoration, besides acting on the skin.

Ipecacuanha.

Mustard is a good stimulating emetic; it neither causes depression at the time, nor leaves any behind; for this reason it is best suited to cases where the object is merely to evacuate the contents of the stomach, as in cases of poisoning, etc., and it is unsuitable to cases where we desire the physiological

Mustard.

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effects of emetics, *viz.*, increased secretion, subjection of the pulse and nervous system, subjugation of fever and the induction of depression. The bulk of the dose (a teaspoonful in half a tumblerful of lukewarm water) is a great objection to its employment for children—in fact, it is only adapted for elder children.

Alum.

In the absence of ipecacuanha, alum (phitkari of the bazaar) may be used as an emetic (*see* formula No. 39) of the non-prostrating class.

Zinc.

Sulphate of zinc in doses of a couple or three grains dissolved in water may be given to a young child: double this quantity being required for children over three or four years of age, and it should be repeated every ten minutes while necessary. It is quick in its action, and does not occasion depression.

Copper.

Sulphate of copper (41) is a powerful emetic, which is sometimes necessary in urgent cases where milder drugs refuse to act or are not likely to act, and where it is desired to avoid depression. It is not in any way dangerous, and it suits children very well.

Country ipecacuanha.

Country ipecacuanha (anta-mul) is a good substitute for the imported article, though not so thoroughly to be relied upon. Waring speaks highly of it.

Caution as to ipecacuanha.

There is no medicine that deteriorates more certainly than ipecacuanha under exposure. A fresh supply should be obtained every year.

Mudar.

Mudar is a native drug which has been entered under the head of emetics, though it is seldom or never employed for that purpose. For dysentery it is held in deservedly high repute.

Directions for collection of.

"The only part employed in medicine is the root-bark, and it is necessary carefully to attend to the subjoined directions for collecting and preparing it for medical use, a disregard of them having been, in some instances, the apparent cause of the failure of the remedy. The roots should be collected in the months of April and May, from sandy soils, and all particles of

sand and dirt having been carefully removed by washing, they should be dried in the open air, without exposure to the sun, until the milky juice contained in them become so far dried that it ceases to flow on incisions being made. The bark is then to be carefully removed, dried, reduced to powder, and preserved in well-corked bottles" (Waring).

Enemata. Purposes of.

ENEMATA have been recommended in four different forms in the foregoing pages, *viz.*, purgative, sedative, astringent, and nutritive. Whatever kind of enema be employed, it is important that no force whatever be used in the introduction of the tube, which should be thoroughly well oiled or greased, and introduced with a gentle rotatory motion; the fact that the intestine slightly inclines to the left side being borne in mind. "For an infant at the breast an enema should not exceed one ounce in quantity: from one to five years, three or four ounces: and from five to ten or fifteen years, about six ounces" (Tanner). But these quantities are too small to ensure rapid action; they may safely be increased. Sedative, astringent, and nutritive enemata must be of very small bulk, it being intended that they be retained by the patient. To accomplish retention, select a time when the child is about to go to sleep, or after it has passed a motion: introduce the fluid, and upon withdrawal of the tube press with a folded towel against the fundament for a quarter of an hour or less, till the sensation produced by the introduction of the tube has passed away.

Cautions.

Bulk of.

To accomplish retention of.

Glycerine enema.

The glycerine enema is admirable and very effective. By means of a small glass syringe it is only necessary to throw half to one drachm of pure glycerine undiluted into the bowel, which will almost immediately void its contents.

Nutritive enemata.

The sustaining effect of nutritive enemata, if properly and sufficiently frequently administered, is wonderful. By their aid a child may often be able to tide over

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an illness to which it would otherwise certainly succumb. Milk, beef-tea, and egg enemata, combined or separately, when often repeated, set up irritation, but by adding a teaspoonful of *Liquor Pepticus* for every four ounces, absorption is facilitated and the liability to irritation diminished.

Opium when injected.

Opium administered by the bowel is said to act with greater power than when given by the mouth, wherefore it is a good plan to employ only half the usually prescribed quantity when it is contained in an enema.

Expectorants.

EXPECTORANTS are medicines which increase the secretion of phlegm or mucus, which then being made thinner is more easily coughed up. This class of medicines acts with great certainty. They vary much in their nature: the depressing expectorants are given in the early stages of inflammatory affections of the chest; under this head are included ipecacuanha and antimony. The stimulating expectorants are given in the latter stages of chest affections, and they include squills, senega, carbonate of ammonia, and one or two others. Judicious combination of these with various other drugs greatly enhances their action.

Action of.

Varieties of.

1. Depressant.

2. Stimulant.

Paregoric elixir contains opium.

The compound tincture of camphor, or paregoric elixir, is a most useful expectorant of a sedative nature; but it contains a small proportion of opium, one-quarter of a grain in every sixty drops, and therefore is to be used with caution in the case of younger children.

Asafœtida.

Asafœtida ("hing" of the bazaars) is a good and useful stimulating expectorant, which may supply a want when other drugs are not at hand. By rubbing down in a mortar five drachms of asafœtida in a pint of hot water, straining and setting aside to cool, a mixture may be prepared, of which a teaspoonful may be given four or five times a day (Waring).

PURGATIVES are a much misused class of medicines; in childhood there are few things more pernicious than their constant administration. Purgatives. Abuse of.

For all ordinary purposes the child should be restricted to castor oil and rhubarb when an aperient is necessary; these medicines being certain, but mild and unirritating in their action. Some purgatives act with great violence, and if handled injudiciously may cause irritation bordering upon inflammation. Those most suitable.

Many fruits and simple and pleasant articles possess a laxative action, which will be made use of by a thoughtful parent before rushing to the medicine chest: such are figs, prunes, tamarinds, honey, treacle, and manna. Fruits as laxatives.

Rhubarb, in addition to its aperient properties, also acts as an astringent after its purgative action has ceased; or when given in very small doses its astringent action alone is exerted. Hence it is not to be used in cases of habitual constipation, and it is most valuable where we wish merely to empty the bowels and afterwards secure their quietude. Rhubarb.

Senna is a good and simple aperient when we desire watery evacuations, but it sometimes gripes a good deal, wherefore it should always be mixed with an aromatic or carminative. Senna.

Castor oil is the blandest of all purgatives; it acts thoroughly without producing any irritation or flatulence. Castor oil.

Some of the other purgatives included in the formulæ are of a powerful nature, such as aloes, scammony, calomel, and podophyllin, and are only to be employed upon the occasions notified in the text. The more powerful aperients.

Epsom salts, or sulphate of magnesia, is not a medicine to be used frequently, except in special cases. It is too lowering in its effects. When the object is to Epsom salts.

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withdraw watery fluid from the system, then it is very valuable.

Refrigerants.

REFRIGERANTS constitute a class of medicines which give comfort in fevers by allaying thirst and cooling the body generally. Some of them are aperient in their action, a fact which should be remembered, some being agreeable to the taste, there may be a temptation to use them habitually. Thus abused they are hurtful, and induce poverty of blood.

Stimulants. Not much required.

STIMULANTS of a medicinal nature are sometimes required in the treatment of the diseases of childhood.

Action of.

They increase the force of the heart's action, and produce a feeling of warmth and energy temporarily. Ammonia, ether, and camphor are the chief stimulants which are employed in cases of exhaustion and debility.

Alcohol.

Alcoholic stimulants are to be administered to children with great caution, because their too free use is succeeded by serious depression. In some affections of great exhaustion, as, for instance, violent watery purging, if used to excess, alcohol produces a narcotic depression, which greatly enhances the danger to the patient. Whenever the fontanelle (p. 154) is depressed, stimulants are always indicated. The white wine whey (receipt 8) is an excellent and very delicate stimulant for infants, particularly when the stomach is irritable. Brandy is valuable, but when combined with eggs (receipt 10) it forms a capital combination of food and stimulant. St. Raphael tannin wine is luscious and well suited to elder children—more palatable to them than the natural wines, it is a reliable and inexpensive preparation (*see* also pp. 175, 176, and 192). Except in an emergency, stimulating foods, such as meat-juice, etc., are to be preferred to alcohol.

Tonics. Classified.

Tonics are a very numerous class of drugs. They increase the tone or power of the nervous system, and are broadly divided into vegetable tonics and mineral tonics.

Action of.

Some tonics, such as iron and cod liver oil, act more as food than medicine, as they are directly absorbed and improve the quality of the blood, whereby the body is better nourished. The mistake people make concerning this class of medicine is that they expect too immediate an action in the first place, for which reason tonics of this nature are often too readily abandoned; and secondly, they seldom continue them sufficiently long to allow of a permanent impression being made. As a rule, such medicines should be persisted in for three or four months. From a stimulant we expect an immediate effect; from a tonic, never.

Iron or steel causes the motions to assume a black colour, darker than, though something like, that occasioned by bismuth.

When not to give.

Tonics should not be given to a child whose bowels are disordered; they are not then likely to be of any service, absorption being too imperfect. Some tonics, notably iron, may act as direct irritants, and increase the mischief in these cases. In short, they are medicines for convalescence, when they will increase the appetite, the force of the pulse, and the muscular strength.

Cod liver oil

Cod liver oil, as stated, is more a food than a medicine; but there is a very common mistake made regarding it, namely, that it is usually given in doses far too large. The stomach is capable of digesting but a very small quantity of this oil, and if more be given than the stomach can dispose of, the remainder passes off unchanged by the bowels, and it may then be both seen and smelt in the stools. "For a child under two

Proper mode of administration.

CHAP. LIV.

years of age ten to twenty drops will be a sufficient dose at first. The quantity after the first few days may be gradually increased, but a careful watch must be kept upon the stools, and the appearance of any oil unchanged in the evacuations is a sign that the quantity must be reduced. For a child of this age we can seldom go beyond thirty drops for the dose three times in the day. If it be found to impair the appetite, or to interfere in the slightest degree with digestion, its use should be immediately discontinued" (Eustace Smith).

Vegetable tonics.

Certain tonics, such as quinine and bark, act chiefly upon the nervous system, bracing up the body and increasing the appetite. Others, such as chiretta and gentian, act upon the stomach and digestive organs, and through them improve the general tone. Arsenic is an incomparable tonic in certain cases, especially when the nervous system is chiefly affected.

SOME RECEIPTS CONNECTED WITH ALIMENTATION.

1. *Lime Water.*

Add two ounces of slaked lime to one gallon of pure water, in a stoppered bottle, shaking well for several minutes. Allow the bottle to stand without any agitation till the superfluous lime is deposited at the bottom, the solution above being perfectly clear. The bottle should stand for twenty-four hours before the clear solution is drawn off for use. Water is capable of dissolving only a certain small proportion of lime, the proper proportion to constitute "lime water" being just as much as the water can dissolve.

A bottle containing lime water should always be kept well corked; access of air spoils lime water.

2. *Saccharated Solution of Lime.*

Take of slaked lime one ounce, and of powdered white sugar two ounces.

Mix them carefully into a powder in a mortar. Transfer the powder to a bottle, and add one pint of water, shaking the bottle well.

The quantity required for each meal is from fifteen to twenty drops of the clear solution.

3. *Barley Water.*

Two teaspoonfuls of washed pearl barley, one pint of water.

Put into a saucepan, and boil down to two-thirds. Strain.

A whole day's supply should not be made at once. It soon turns sour. Once made it should never again be heated to boiling.

4. Gelatine Solution.

A teaspoonful of good gelatine or isinglass.

Half a tumblerful of cold water.

Mix. Allow to stand for three hours. Turn into a cup. Stand the cup in a saucepan half full of water, and boil till the gelatine is dissolved.

When cold this forms a jelly, of which a teaspoonful is to be added to half a bottleful of milk and water food to prevent curdling in the stomach.

5. *Beef Tea.*

Put half a pound or a pound of rump steak, cut up into small pieces, into a copper-covered saucepan, with one pint of cold water. Let it stand by the side of the fire for four or five hours, and let it then simmer gently for two hours. Skim well, and serve.

The meat should be as fresh as possible—the fresher the better—and should be cleansed beforehand of all fat and gristle. If this precaution be neglected, a greasy taste is given to the beef tea, which cannot afterwards be removed by skimming. Iron saucepans, if used, should be enamelled.

In re-warming beef tea which has been left to cool, care must be taken to warm the tea up to the point at which it is to be served, and no higher. It should on no account be allowed to boil. (Eustace Smith.) Beef tea is a food stimulant, not a true food, and should never be wholly trusted to for nourishment in a prolonged illness.

6. *Juice of Raw Meat.*

Take a pound, or whatever quantity required, of the best rump steak, free from all fat. Cut it into the finest mince. Put it into a bowl. Add cold water, to which a few drops of diluted muriatic acid and a pinch of salt have been added, just sufficient to moisten the mass well. Set aside to stand for an hour, during which time it may occasionally be stirred. Strain through a coarse cloth, using pressure. The pulpy mass of flesh ought to be nearly bleached, while the liquid should be of a port-wine colour.

7. *Raw Meat.*

The lean of steak or chop pounded in a mortar into a pulp and then strained through a fine sieve. It may be eaten as it is, or diffused through jelly or broth. A dose of pepsine should always precede its consumption. A teaspoonful four times a day may be increased to half a pound daily.

At first the motions become very fetid, but this soon passes off.

8. *White Wine Whey.*

To a breakfast-cupful of new milk in a saucepan, placed upon a fire, add a wineglassful of good sherry when the boiling-point has been reached. Then boil again for one minute and strain off the curd. Sweeten with sugar. A feeble infant will take a tablespoonful every fourth hour.

9. *Peptonised Milk.*

Add a pint of boiling water to a pint of new milk. Then add two teaspoonfuls of Benger's *liquor pepticus*, and twenty grains of the bicarbonate of soda. Or one of Fairchild's Peptogenic Powders. Mix well, and put it aside *in a warm but not hot place* for an hour, in a jug. Then pour it again into the saucepan and boil for two minutes to prevent further action of the ferment. Sweeten to taste with sugar of milk.

The same object may be more easily attained by the use of "Fairchild's Peptonising Powders," or Savory and Moore's "Peptonising Pellets", which are very convenient. Of the latter, one is required for each pint of milk, to which, after it has been brought to the proper temperature, the pellet is added; a quarter of an hour's delay completes the process. Printed directions accompany each box of powders.

10. *Brandy and Egg Mixture.*

Rub the yolks of two eggs up with about half an ounce of sugar. To this add four ounces of cinnamon water, and finally four ounces of brandy.

Half to one teaspoonful as often as necessary for a child of a year old.

11. *Cheadle's Bread Jelly with Meat-juice and Cream*

Is prepared by soaking in cold water for six or eight hours four ounces of stale bread; after being well squeezed the pulp is boiled in fresh water for 1½ hour; strained and rubbed through a fine hair sieve and allowed to cool to a jelly. A tablespoonful is to be mixed with eight ounces of water previously boiled. Makes a cream-like food.

To five teaspoonfuls of the solution, six teaspoonfuls of raw meat-juice, two teaspoonfuls of cream, and about ½ teaspoonful of white sugar may be added The meat-juice must not be added to the food while hot. From two to three ounces of raw meat-juice may thus be given in twenty-four hours.

This is an excellent food when it is necessary to suspend milk temporarily. The proportion of meat-juice may be increased as required by the case.

For many cases the meat-juice is not suitable. Then the bread jelly alone, or the jelly with the addition of cream may be used. Milk can subsequently be added in small quantity as the case improves. If meat-juice is given, only sufficient for immediate use should be prepared, as it decomposes very rapidly.

PRESCRIPTIONS.

Classified as follows :—

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N. B.—The difficulty of stating the doses of medicines for children of different ages is very great—indeed, it is impossible to do so in a series of prescriptions. A usual rule, which is pretty generally applicable, is here stated with the object of releasing parents from an occasional dilemma ; at the same time it should be mentioned that it is not universally applicable to all drugs, but care has been taken in the text to give special directions when medicines requiring particular care are suggested.

Rule.—*Add* 12 *years to the child's age and divide the actual age by the result. The fraction so obtained will give the fraction of the adult dose suited to the child.* Example, a child is aged 4 years. 4 *plus* 12 is 16. Therefore four-sixteenth (that is, one-fourth) of the adult dose is the proper dose for the child in question. Put shortly ; $4+12=16. \therefore \frac{4}{16}=\frac{1}{4}$ the adult dose.

Alteratives (p. 428).

1. Alterative and sedative.

Take

Iodide of potassium, twelve grains.
Bromide of potassium, half a drachm.
Water, one ounce. Mix.

Dose—One teaspoonful every third or fourth hour (an ordinary dose for two years, but many exceptions).

2. Chlorate of Potash mixture.

Take

Chlorate of potash, half a drachm.
Water, four ounces. Mix.

Dose—Two teaspoonfuls every third or fourth hour for a child of one or two.

3. Alterative and tonic.

Take

Iron wine, half an ounce.
Syrup of tolu half an ounce.
Fowler's solution of arsenic, twelve minims.
Dill water, one ounce. Mix.

Dose—One teaspoonful three times a day, after meals (for age of two years).

According to Erasmus Wilson, this is almost a specific in eczema of children.

Or,

Cod liver oil, one ounce.
Yolk of egg, half ounce.
Fowler's solution of arsenic, twenty-two minims.
Syrup, two drachms.
Pure water, two ounces. Mix.

Dose—One teaspoonful three times a day, immediately after meals, for a child 1½ year old and upwards.

Anthelmintics (p. 432).

4. Santonin.

Take
Santonin, three grains.
Compound scammony powder, three grains.
Calomel, one grain. Mix.

The powder to be taken as directed at page 318 (for six or eight years).

Santonin is a specific for round-worms.

5. Pomegranate.

Take of fresh-sliced pomegranate root-bark, two ounces. Of water, two pints. Boil down to one pint and strain. Of this, one to two table-spoonfuls should be taken fasting, early in the morning, and repeated every half-hour until four doses have been taken. An aperient should be given subsequently—castor oil being the most suitable. The worm will probably be expelled in about twelve hours (*vide* p. 320).

6. Male fern.

Take
Liquid extract of male fern, twenty minims.
Essence of ginger, twenty drops.
Syrup, two drachms.
Water to half an ounce. Mix.

The draught to be taken as directed at page 320. (For children of three years and upwards.)

Antispasmodics, Sedatives, and Carminatives (p. 432).

7. Stimulant antispasmodic.

Take (*a*)
Spirits of ether, forty minims.
Spirits of chloroform, forty minims.
Compound tincture of cardamoms, two drachms.
Spirits of nutmeg, half a drachm.
Oil of carraways, three minims.
Peppermint water, four and a half ounces. Mix.

Dose—One or two teaspoonfuls every three hours, for a child two years old, in colic, flatulence, and spasm (Tanner). *This should be kept ready made up.*

Or (*b*)
(in the absence of the above),
Take
Bicarbonate of soda, twelve grains.
Sal volatile, fifteen minims.
Glycerine, forty minims.
Peppermint water to one ounce. Mix.

A small teaspoonful as often as necessary (for an infant).

8. Chloral sedative (p. 433).

Take
Hydrate of chloral, six grains.
Tincture of belladona, four minims.
Glycerine, one drachm.
Water, three drachms. Mix.

Half to one drachm for an infant.
One to two for a child over one year.
Not to be repeated for six hours at least.

Or,

Keep one ounce of a syrup of chloral, prepared by a chemist, strength 1½ grain to each drachm, in stock. Dose —as above.

Or,

To each teaspoonful of the bromide mixture (9) add one grain of chloral (that is, eight grains to the whole).

8 (*a*). Sulphonal (p. 433).

Only soluble in hot fluids. Dose—eight to ten grains for a child of ten. Not to be repeated.

8 (*b*).

Take

Bromide of ammonium, forty grains.
Sweet spirits of nitre, one drachm.
Hydrate of chloral, nine grains.
Syrup of orange flowers, half an ounce.
Chloroform water to complete to three ounces. Mix.

One drachm every second hour for an infant one year old (Whitla).

8 (*c*) Trional. (For full directions and dose, see p. 433.)

9. Bromide of potassium (p. 432).

To be of active service as a sedative this medicine must be used in full doses. Two or three doses of ten grains each may be given at intervals of four hours to a child three years old if it is desired to ward off convulsions.

The following is a useful formula :—

Take of

Bromide of potassium, twenty-four grains.
Glycerine, two drachms.
Water up to one ounce.

Dose—A teaspoonful every second hour for an infant. (A drop of tincture of belladonna per dose is a good addition)

10. Aromatic waters.

(a) Carraway-seed water.

"A perfectly useful carraway water may be made in the nursery by boiling two teaspoonfuls of crushed carraway seeds, enclosed in a little muslin bag, in a pint of water, until the quantity is reduced to one half" (E. Smith).

(b) Dill water.

A useful dill water for the nursery in the absence of the distilled preparation as obtainable from the chemist, may be made as follows :—

Take of Indian dill seeds (Soyah or shulpha of the bazaars), three drachms.
Hot water, half a pint.
Infuse till cold, and then strain.

Dose—A dessertspoonful slightly sweetened with sugar.

Its efficacy is often much increased by the addition of a teaspoonful of lime water (Waring).

Applications (p. 428).

11. Dusting powder.

Take

Oxide of zinc, one part.
Powdered starch, three parts.
Mix thoroughly in a mortar (p. 429).

12. Soap liniment (a substitute for opodeldoc).

Take

Soft soap, two ounces.
Boiling water, one pint.
Dissolve thoroughly.

13. Cold lotion.

Take

Sal ammoniac, one and a half drachm.
Methylated spirits, six drachms.
Water to six ounces. Mix.

Note.—Nitre, nitrate of potash or saltpetre is called "*shora*" in Hindustani. Sal ammoniac, or chloride of ammonium, is known in the bazaar as "*nowsadar*."

14. Arnica lotion.

Take

Tincture of arnica, six drachms.
Rain water, eight ounces. Mix.

To be used as a lotion for sprains and bruises (p. 387).

15. Borax application.

Take

Borax, half a drachm.
Glycerine, one drachm.
Water, one ounce.

Applied to the mouth in thrush, this is a specific.

16. Ringworm ointment.

Take

Chrysophanic acid, ten grains.
Lanolin or vaseline, one ounce.
Rub well together.

This stains linen.

17. Zinc ointment.

Take

Oxide of zinc, eighty grains.
Fresh lard, one ounce.
Rub together.

18. Stimulating liniments.

A useful *camphor liniment* may be made by dissolving one ounce of camphor in six ounces of cocoanut or any other bland oil.

Or,

For a good *turpentine liniment*,

Take

Camphor, one part.
Turpentine, sixteen parts.
Soft soap, two parts.
Rub together till thoroughly mixed.

19. Galls ointment.

Take

Galls (mai-phal of bazaars) powdered, one and a half drachm.
Ghee, one ounce. Mix.

Very useful in piles and protrusion of the bowel.

20. Itch ointment.

Take

Sulphur, one ounce.
Lard, four ounces.
Rub together.

21. Resin ointment.

Take

White damar (sufed damar), five ounces.
Lard or kokum butter, eight ounces.
Wax, two ounces.
Melt with a gentle heat, stirring briskly as it cools (Waring).

22. Turpentine ointment.

Take

Turpentine, one ounce.
White or black damar, sixty grains.
Yellow wax and lard, half an ounce.
Melt well together, stirring it while cooling.

An excellent application for indolent and ill-conditioned ulcers (Waring).

23. Eye lotion.

Take

Alum, twelve grains.
Sulphate of zinc, six grains.

Infusion of poppy-heads, six ounces, Mix.
To be used constantly.

24. Carbolic lotion.

Take
Carbolic acid (rendered flui by a gentle heat if it be solid), one part.
Luke-warm water, sixty to eighty parts.
Shake well together.

25. Carbolic oil.

Take
Carbolic acid (fluid), one part.
Any bland oil slightly heated, twelve parts.
Shake thoroughly.

26. Glycerine of tannic acid.

Take
Tannic acid, one drachm.
Glycerine, four drachms. Mix.

27. Iodine.

The ointment is useful for the dispersion of swellings, and in cases of enlargement of the spleen.
Iodine paint is also supplied by the chemist. It should be painted over swellings of the glands, when acute inflammation has subsided, by means of a camel's-hair pencil, night and morning. If the child be very young the paint should be diluted with brandy.

28. Aloes liniment.

Take
Tincture of aloes, half an ounce.
Soap liniment, one ounce. Mix.
To be rubbed daily for five minutes into the belly. Should not be employed in the case of a child under two years of age.

Astringents (p. 434).

29. Simple aromatic astringent.

Take
Aromatic chalk powder, thirty grains.
Tincture of catechu, one drachm.
Mucilage, two drachms.
Peppermint water to one ounce. Mix.
Dose—Half a teaspoonful three or four times a day for six months of age; one or two teaspoonfuls between twelve and twenty-four months. Very useful in simple diarrhœa.

Or,

(if dependent upon the bazaar)
Take
Catechu powder, four grains.
Cinnamon, powdered, four grains. Mix.
The powder to be taken three times a day.

30. Gallic acid.

Take
Gallic acid, one drachm.
Mucilage, half an ounce.
Water, two ounces. Mix.
Dose—One teaspoonful after every watery motion.
A direct astringent of value.

31. Bismuth and opium.

Take
Bismuth, thirty grains.
Bicarbonate of soda, twelve grains.
Compound powder of chalk with opium, twelve grains.
Mix thoroughly, and divide into six equal powders.
Caution.—Each powder contains one-twentieth of a grain of opium. Therefore this prescription should not be used for children under six months of age, and not more than one powder should be given to a child under

nine months in the course of twenty-four hours. Two in the twenty-four hours should not be given till a full year of age has been completed, and so on, two powders for each year of age being allowable as a maximum.

This medicine may be used in conjunction with any pure astringent.

32. Acid astringent.

Take

Diluted sulphuric acid (1 to 12 water), eighteen drops.
Tincture of catechu, thirty-six drops.
Syrup of ginger, two drachms.
Water, nine drachms. Mix.

Take two teaspoonfuls every fourth hour.

If the tincture of catechu be not at hand, gallic acid, twelve grains, may be substituted; or the solid catechu eighteen grains, if it can be obtained tolerably pure.

33. Alterative astringent.

Bael fruit (the half-ripe fruit, if procurable, is best, but the dried fruit also answers) is a very valuable remedy in cases of diarrhœa and dysentery when febrile symptoms have subsided.

Take of the soft gummy interior, two ounces. Mix with three or four ounces of water; sweeten to the taste. Take one-fourth part twice or three times a day. (Caution, *see* p. 434.)

33 (*a*). Antiseptic astringent.

(*See* p. 292.)

34. Oxide of Zinc.

Take

Oxide of zinc, sixteen grains.
Glycerine, three drachms.
Mucilage, half an ounce.
Water to two ounces. Mix.

A teaspoonful three or four times a day for an infant. The quantity of zinc may be increased for a child of one year.

35. Cold.

Ice broken into small pieces, and put into a bladder, applied to the head in cases of fever with headache, or of inflammation of the brain, is a valuable remedy (p. 172). It may also be used in lumps or pulverised, to prevent bleeding from wounds, or to moderate swellings and inflammations.

Or,

The freezing mixture,

Consisting of five ounces of sal ammoniac, five ounces of saltpetre, and ten ounces of water mixed together and enclosed in a bag, will cause the thermometer to sink from 50° to 10°.

Diaphoretics, or Fever Medicines (p. 435).

36. Sweating mixture.

Take

Nitrate of potash, ten grains.
Ipecacuanha wine, two drachms.
Syrup, two drachms.
Barley water, two ounces. Mix.

Dose—One drachm every second or third hour for a child under six months of age. Two drachms up to twelve months. A dessertspoonful beyond this age, up to the second year, after which a tablespoonful may be given in common colds and fevers.

37. Antifebrin. (*See* pp. 436.)

38. Fever mixture.

Take

Solution of acetate or citrate of ammonia, half an ounce.
Nitrate of potash, twenty grains.
Sweet spirits of nitre, one drachm.
Syrup, three drachms.
Water, three ounces. Mix.

DOSE—Same as No. 36.

38 (*a*).

Salicylate of soda, one drachm.
Liquid extract of liquorice, half an ounce.
Solution of acetate of ammonia, half an ounce.
Water to two ounces.

Half a drachm to one drachm for a dose, in febrile conditions, in diarrhœa and rheumatism.

EMETICS (p. 436).

39. Simple emetic.

Take

Ipecacuanha powder, one grain.
Sugar, three or four grains. Mix.

This powder may be given to the youngest infant every quarter of an hour, till vomiting results.

Or,

Country ipecacuanha (anta-mul of the bazaar), the powdered dry leaves, of which three or four grains will cause vomiting. In larger doses it may be substituted for ipecacuanha in treating dysentery.

Or,

Alum may be used in the absence of ipecacuanha. Three drachms should be mixed with one ounce of syrup. Of this one-third part may be given every quarter of an hour or ten minutes.

40. Stimulating emetic.

Take

Ipecacuanha powder, eight grains.
Ipecacuanha wine, one ounce. Mix.

Dose—One teaspoonful with water every quarter of an hour, till vomiting is produced.

41. Powerful emetic.

Take

Sulphate of copper, two to six grains.
Water, half an ounce. Dissolve.

One quarter part every ten minutes in rice water till vomiting occurs.

Useful in the third stage of croup, after one year of age.

Or,

Sulphate of zinc (*see* pp. 442, 438).

42. Mudar (p. 438).

Is a good substitute for ipecacuanha in the treatment of dysentery. If not given with the usual precautions, it will cause vomiting. The dose and mode of administration are the same as of ipecacuanha.

ENEMATA (p. 439).

43. Worm injection.

Take

Table salt, one to two teaspoonfuls.
Olive oil, half an ounce.
Conjee water, three ounces. Mix.

Useful for killing and expelling thread-worms.

44. Purgative enema.

Take

Castor oil, two drachms.

Thin warm gruel, three ounces. Mix.
Useful in ordinary constipation.

Or,

Aloes, ten to twenty grains.
Boiled milk, three ounces. Mix.
Useful when castor oil is insufficient.

44 (*a*). Glycerine enema (p. 439).

45. Purgative and antispasmodic enema.

Take of
Castor oil, two drachms.
Turpentine, two drachms.
Tincture of assafœtida, half a drachm.
Rice water, three ounces. Mix.
Very useful in convulsions.

Expectorants (p. 440).

46. Sedative and expectorant.

Take of
Spirits of nitric ether, one drachm.
Compound tincture of camphor, thirty-six minims.
Ipecacuanha wine, twenty-four minims.
Syrup, three drachms.
Water, one and a half ounce. Mix.
Dose—One teaspoonful every fourth hour.
Caution.—This mixture contains a little more than one-eighth part of a grain of opium.

47. Stimulating expectorants.

Take of
(1) Carbonate of ammonia, eight grains.
Ipecacuanha wine, one drachm.
Tincture of senega, two drachms.
Oxymel of squills, three drachms.
Water, three ounces. Mix.
Dose—One teaspoonful every second hour for an infant under one year of age. Double this quantity for between one and two years. A tablespoonful after the latter age.
Useful in the obstinate coughs of weakly children.

Or,

(2) Ipecacuanha wine, thirty-six minims.
Carbonate of ammonia, five grains.
Syrup, two drachms.
Water, ten drachms. Mix.
Dose—Two teaspoonfuls every fourth hour, for a child of two years.

Purgatives (p. 441).

48. Castor oil.

Dose—Half a teaspoonful for a child under one year of age. A full teaspoonful is sufficient for a child of any age. May be mixed with an equal quantity of glycerine.

49. Red mixture.

Take of
Rhubarb, ten grains.
Carbonate of magnesia, thirty grains.
Sal volatile, half a drachm.
Aniseed oil, two drops.
Water, two ounces. Mix.
Dose—A teaspoonful, repeated every fourth hour till it operates.

50. Gregory's powders.

Take of
Rhubarb, two drachms.
Magnesia, six drachms.
Ginger, one drachm. Mix thoroughly and pass through a fine sieve.
Dose—Five to twenty grains.

51. Castor oil emulsion.

Take of
Powdered gum acacia, three drachms.
Powdered loaf sugar, three drachms.
Oil of peppermint, two drops.
Castor oil, one ounce.
Rub the acacia, sugar, and oil of peppermint together into a powder; add about six drachms of water; then add the castor oil by degrees, with a little more gum or a little more water, as may be necessary to make a perfect emulsion. Then add water slowly to bring the quantity to *four ounces*. Of this mixture one tablespoonful equals one teaspoonful of castor oil, and a teaspoonful equals fifteen drops.

Dose--For inflammatory diarrhœa, half to a whole teaspoonful every fourth or sixth hour for a child of two or three years.

Or,

Castor oil, one drachm.
Gum acacia. twenty grains.
Syrup, two drachms.
Carraway water to one ounce.

Dose—One drachm (equal seven and a half drops) every fourth hour, or oftener.

52. Senna.

Take of
Senna leaves, one ounce.
Bruised ginger, half a drachm.
Bruised cloves, half a drachm.
Boiling water, ten ounces.
Stand for half an hour.

Dose—For a child of two years, one teaspoonful. The simple infusion without the aromatics may be given with sugar and milk, when it can hardly be distinguished from ordinary tea.

53. Salts and senna.

Take of
Sulphate of magnesia, one drachm.
Infusion of senna, one ounce.

The draught to be taken by a child of ten or twelve.

54. Epsom salts draught.

Take of
Sulphate of magnesia, twenty grains.
Syrup of ginger, one drachm.
Peppermint water, three drachms.

The draught, for a child above a year old.

55. Continuous purgation.

Take of
Sulphate of mangesia, two drachms.
Nitrate of potash, twenty grains.
Syrup, half an ounce.
Water, one ounce. Mix.

Dose—Two teaspoonfuls twice or three times a day, when it is desired to keep up purgation, as in head affections of young children.

56. Strong purgatives.

Take of
Calomel, one grain.
Jalap, five grains.
Powdered ginger, two grains. Mix.

The powder, suitable for a child of eight or ten years. This should be followed by a dose of senna or Epsom salts in a few hours.

Or,

Take of
Compound powder of scammony, two grains.
Calomel, half a grain.

The powder, for a child of one year.

57. Podophyllin.

Take of

Podophyllin, one grain.

Alcohol, one drachm. Dissolve.

Dose—Five to ten drops in syrup twice or three times a day.

58. Aloes.

Take of

Powdered aloes, one drachm.

Syrup, two ounces. Mix.

Dose—One teaspoonful every third hour till a satisfactory result is obtained.

Or,

By adding to the above, sulphate of iron, four grains, a mixture is formed which is most valuable in some forms of constipation (p. 285).

59. Other purgatives.

Other useful and portable aperients are—

(*a*) The compound liquorice powder of the German pharmacopœia, of which five to ten grains or more, mixed with milk, taken early in the morning, is a mild and agreeable laxative.

(*b*) The liquid extract of cascara, dose two to four drops twice a day.

Refrigerants (p. 442).

60. Lemonade.

Five or six limes sliced, added to one pint of boiling water. Allowed to stand till cool, then strained and sweetened to taste.

Or,

Tamarinds, one ounce.

Water, one pint.

Make an excellent cooling drink, but it must be recollected that it possesses aperient properties.

61. Seidlitz powder for children.

Take of

Bicarbonate of soda, ten grains.

Tartrated soda, thirty grains.

Dissolve in one ounce of water, adding a little syrup and essence of lemon. Then in another glass dissolve eight grains of tartaric acid in one tablespoonful of water. The contents of the glasses should be poured together, and the whole drank while effervescing. An agreeable, mild aperient in the warm weather for strong children, but it is not one which should be frequently used.

62. Effervescing draughts.

Take of

Bicarbonate of potash, one drachm.

Water, sweetened and flavoured with syrup of lemon, three ounces. Mix and put into a bottle; then dissolve forty-two grains of citric acid in three ounces of water in another bottle.

One tablespoonful of each thrown together will form a refreshing draught

63. Fever drink.

Nitrate of potash (nitre), ten grains.

Barley water, one pint.

A wineglassful occasionally to quench thirst.

Stimulants (p. 442).

64.

Take of

Diluted hydrochloric acid, sixteen minims.

Spirits of chloroform, sixteen minims.

Camphor water, one ounce. Mix.

Dose—One teaspoonful every two or three hours (for a child of two).

65.

Take of
Carbonate of ammonia, twelve grains.
Chloric ether, half a drachm.
Infusion of cloves, four ounces. Mix.

Dose—One drachm to a dessert-spoonful three times a day (for one year).

Tonics (p. 443).

66. Quinine tonic.

Take of
Quinine, four grains.
Limejuice, twenty drops (or four drops of diluted sulphuric acid).
Infusion of orange peel, two ounces. Mix.

Dose—One to two teaspoonfuls three times a day, shortly before food.

67. Antiperiodic.

Take of
Quinine, twenty grains.
Limejuice, one teaspoonful (or twenty drops of diluted sulphuric acid).
Syrup, two drachms.
Water to one ounce. Mix.

Dose—One-eighth part for a child a year old. Double that quantity for a child of two years. Strong doses of quinine should, as far as possible, not be given on an empty stomach.

68. Steel and quinine tonic.

Take of
Tincture of steel, twenty-four drops.
Quinine, four grains.
Water, one ounce. Mix.

Dose—One teaspoonful three times a day after meals, for a child of two years.

Or,
Citrate of Iron and quinine.

Dose—One to two grains in water.

69. Chiretta.

(*b*). Infusion.

Take of
Bruised chiretta, one ounce.
Cold water, one pint.
Bruised cloves or cinnamon, one drachm.
Infuse for six hours and strain.

Dose—A dessertspoonful to a tablespoonful twice or three times a day, before food.

70. Aperient tonic.

Take of
Tincture of steel, one drachm.
Epsom salts, one drachm.
Quinine, six grains.
Water, six ounces. Mix.

Dose—One tablespoonful three times a day for a child of from six to eight years.

A valuable tonic in the dropsy following malarial poisoning, when there is also a tendency to constipation.

Or (*b*),
Epsom salts, forty grains.
Diluted sulphuric acid, sixteen minims.
Sulphate of iron, four grains.
Syrup of ginger, half drachm.
Peppermint water, to two ounces. Mix.

Dose—One drachm for a child a year old.

71. Iron tonics.

Take of
Syrup of iodide of iron, ten minims.
Cod liver oil, half a drachm.

To be given three times a day, after food, to a child of two years.

Or,

The syrup of iodide of iron may be given alone.

Or,

The syrup of the phosphate of iron, ten to twenty drops three times a day, after meals.

Or,

Wine of iron (made by mixing one drachm of citrate of iron and ammonia with an ounce of rectified spirits of wine and seven ounces of water).

Dose—One drachm and upwards.

Or,

Parrish's chemical food, a quarter, half, or a full teaspoonful in as much water, to children of two, five, and ten respectively.

72. Country sarsaparilla.

Take of

Hemidesmus root (called in the bazaar Hindi-Sal-sa or jungli chaubelli), bruised, one ounce.

Boiling water, half a pint.

Infuse in a covered vessel for half an hour and strain.

Dose—One to three tablespoonfuls three times a day. The efficacy of the medicine is much increased by taking it when warm. Sugar and milk added to it make it so like tea that children will readily take it. Waring says it is a "particularly useful tonic for the pale weakly offspring of Europeans in India."

73. Cod liver oil.

For mode of administration, *see* page 443.

74. Pepsine.

The dose of the wine is a quarter to half a teaspoonful given with meals.

Of the powder, half a grain to two grains given in water with a drop of hydrochloric acid, three times a day with meals.

TABLE OF WEIGHTS AND MEASURES.

Solid Measure.

					Marked thus :
20 grains* make	...	...	...	one scruple	℈j
3 scruples ,,	...	...	...	one drachm	ʒj
8 drachms ,,	...	...	...	one ounce	℥j
12 ounces ,,	...	...	...	one pound	℔j

Fluid Measure.

60 drops or minims make 1 drachm, equal to one ordinary-sized teaspoonful.

8 drachms make 1 ounce, equal to two ordinary-sized table-spoonfuls.

20 fluid ounces make 1 pint, and eight pints equal one gallon.

---

* The grain weights are usually marked with dots corresponding to their numbers, thus : | 0 | 0 0 | 0 00 | &c., &c.

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